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TRANSACTIONS

OF THE

AMERICAN ASSOCIATION

OF

OBSTETRICIANS, GYNECOLOGISTS

AND

ABDOMINAL SURGEONS

VOL. XXXIV

FOR THE YEAR 1921

Edited by E. Gustav Zinke, M.D., F.A.C.S.,
Cincinnati

and James E. Davis, A.M., M.D.,
Detroit

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NOTE

The Association does not hold itself responsible for the views enunciated in the papers and discussions published in this volume.

DR. E. GUSTAV ZINKE, *Secretary,*
4 W. SEVENTH AVENUE, CINCINNATI.

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CONSTITUTION AND BY-LAWS

OF THE

AMERICAN ASSOCIATION

OF

OBSTETRICIANS, GYNECOLOGISTS,

AND

ABDOMINAL SURGEONS

TOGETHER WITH

MINUTES OF THE THIRTY-FOURTH ANNUAL MEETING

AMERICAN ASSOCIATION
OF
OBSTETRICIANS, GYNECOLOGISTS,
AND
ABDOMINAL SURGEONS

CONSTITUTION

I. The name of this Association shall be THE AMERICAN ASSOCIATION OF OBSTETRICIANS, GYNECOLOGISTS, AND ABDOMINAL SURGEONS.*

II. Its object shall be the cultivation and promotion of knowledge in whatever relates to Obstetrics, Gynecology, and Abdominal Surgery, except that which is peculiar to the male.

MEMBERS

III. The members of this Association shall consist of Ordinary Fellows, Honorary Fellows, Corresponding Fellows, and Senior Fellows.

The Ordinary Fellows shall not exceed one hundred and fifty in number.

The Honorary Fellows shall not exceed ten American and twenty-five foreign.

Candidates shall be proposed to the Executive Council at least three months before the first day of meeting, by two Fellows, and shall be balloted for at the annual meeting, a list of names having been sent to every Fellow with the notification of the meeting.

A two-thirds vote in the affirmative of all members present shall be necessary to elect—fifteen Fellows at least being in attendance.

All candidates for active fellowship shall submit to the Executive Council, at least three months before the annual meeting, an original paper relating to Obstetrics, Gynecology, or Abdominal Surgery, as indicated in Article II.

HONORARY FELLOWS

IV. The power of nominating Honorary Fellows shall be vested in the Executive Council.

Their election shall take place in the same manner as that of Ordinary Fellows.

They shall enjoy all the privileges of Ordinary Fellows, excepting to vote or hold office, but shall not be required to pay any fee.

*At the Annual Session held in Atlantic City, September, 1920, the name of the Association was changed as above indicated.

CORRESPONDING FELLOWS

V. The Corresponding Fellows shall be recommended by the Executive Council and elected by the Association.

They shall enjoy all the privileges of Ordinary Fellows, excepting to vote or hold office, and shall be entitled to a copy of the annual TRANSACTIONS.

They shall pay an annual fee of five dollars.

SENIOR FELLOWS

Senior Fellows shall be nominated by the Executive Council, and elected by the Association as provided for in the election of Honorary Fellows, and they shall enjoy the same privileges as are accorded Corresponding Fellows.

OFFICERS

VI. The officers of this Association shall be a President, two Vice-Presidents, a Secretary, an Assistant Secretary, a Treasurer, and six Executive Councillors.

The nomination of all officers shall be made in open session at the business meeting, and the election shall be by ballot.

The first five officers shall enter upon their duties immediately before the adjournment of the meeting at which they shall be elected, and shall hold office for one year.

At the election next succeeding the adoption of these laws, the full number of Executive Councillors shall be elected; two for a term of three years, two for a term of two years, and two for a term of one year.

At every subsequent election two Councillors shall be elected for a term of three years, and shall continue in office until their successors shall have been elected and shall have qualified.

Any vacancy occurring during the recess may be filled temporarily by the Executive Council.

ANNUAL MEETINGS

VII. The time and place of holding the annual meeting shall be determined by the Association or may be committed to the Executive Council each time before adjournment.

It shall continue for three days, unless otherwise ordered by vote of the Association.

AMENDMENTS

VIII. This Constitution may be amended by a two-thirds vote of all the Fellows present at the annual meeting: *provided*, that notice of the proposed amendment shall have been given in writing at the annual meeting next preceding: and *provided further*, that such notice shall have been printed in the notification of the meeting at which the vote is to be taken.

AMERICAN ASSOCIATION

OF

OBSTETRICIANS, GYNECOLOGISTS,

AND

ABDOMINAL SURGEONS

BY-LAWS

THE PRESIDING OFFICER

I. The President, or in his absence, one of the Vice-Presidents shall preside at all meetings, and perform such other duties as ordinarily pertain to the Chair.

The presiding officer shall be *ex-officio* chairman of the Executive Council, but shall vote therein only in case of a tie.

SECRETARY

II. The Secretary shall attend and keep a record of all meetings of the Association and of the Executive Council, of which latter he shall be *ex-officio* clerk, and shall be entitled to vote therein.

He shall collect all moneys due from the members, and shall pay the same over to the Treasurer, taking his receipt therefor.

He shall supervise and conduct all correspondence of the Association; he shall superintend the publication of the TRANSACTIONS under the direction of the Executive Council, and shall perform all the ordinary duties of his office.

He shall be the custodian of the seal, books, and records of the Association.

ASSISTANT-SECRETARY

III. The Assistant-Secretary shall assist the Secretary, and shall assume the duties of the latter, should he, for any reason, become incapacitated.

TREASURER

IV. The Treasurer shall receive all moneys from the Secretary, pay all bills, and render an account thereof at the annual meetings, when an

Auditing Committee shall be appointed to examine his accounts and vouchers.

EXECUTIVE COUNCIL

V. The Executive Council shall meet as often as the interests of the Association may require. The President, or any three members may call a meeting, and a majority shall constitute a quorum.

It shall have the management of the affairs of the Association, subject to the action of the house at its annual meetings.

It shall have control of the publications of the Association, with full power to accept or reject papers or discussions.

It shall have control of the arrangements for the annual meetings, and shall determine the order of the reading of papers.

It shall constitute a court of inquiry for the investigation of all charges against members for offences involving law or honor; and it shall have the sole power of moving the expulsion of any Fellow.

ORDER OF BUSINESS

VI. The Order of Business at the annual meetings of the Association shall be as follows:

1. General meeting at 10 o'clock A.M.
   a. Reports of Committees on Scientific Questions.
   b. Reading of Papers and Discussion of the same.
2. One business Meeting shall be held at half-past nine o'clock A.M. on the first day of the session, and another on the evening of the second day (unless otherwise ordered by vote), at which only the Fellows of the Association shall be present. At these meetings the Secretary's record shall be read; the Treasurer's accounts submitted; the reports of Committees on other than scientific subjects offered; and all miscellaneous business transacted.

PAPERS

VII. The titles of all papers to be read at any annual meeting shall be furnished to the Secretary *not later* than one month before the first day of the meeting.

No paper shall be read before the Association that has already been published, or that has been read before any other body.

Not more than thirty minutes shall be occupied in reading any paper before the Association.

Abstracts of all papers read should be furnished to the Secretary at the meeting.

All papers read before the Association shall become its sole property if accepted for publication; and the Executive Council may decline to publish any paper not handed to the Secretary *complete* before the final adjournment of the annual meeting.

QUORUM

VIII. The Fellows present shall constitute a quorum for all business, excepting the admission of new Fellows or acting upon amendments to the Constitution, when not less than fifteen Fellows must be present.

DECORUM

IX. No remarks reflecting upon the personal or professional character of any Fellow shall be in order at any meeting, except when introduced by the Executive Council.

FINANCE

X. Each Fellow, on admission, shall pay an initiation fee of thirty dollars, which shall include his dues for the first year.

Every Fellow shall pay, *in advance* (*i.e.*, at the beginning of each fiscal year) the sum of twenty-five dollars annually thereafter.

[A fiscal year includes the period of time between the first day of the annual meeting and the first day of the next.]

Any Fellow neglecting to pay his annual dues for two years may forfeit his membership, upon the vote of the Executive Council.

The Secretary shall receive, annually, a draft from the President, drawn on the Treasurer, for a sum, to be fixed by the Executive Council, for the services he shall have rendered the Association during the year.

A contingent fund of one hundred dollars shall be placed annually at the disposal of the Secretary for current expenses, to be disbursed by him, and for which he shall present proper vouchers.

ATTENDANCE

XI. Any Fellow who shall neither attend nor present a paper for five consecutive years, unless he offers a satisfactory excuse, shall be dropped from fellowship, upon the vote of the Executive Council.

RULES

XII. *Robert's Rules of Order* shall be accepted as a parliamentary guide in the deliberations of the Association.

AMENDMENTS

XIII. These By-Laws may be amended by a two-thirds vote of the Fellows present at any meeting; *provided* previous notice in writing shall have been given at the annual meeting next preceding the one at which the vote is to be taken.

LIST OF OFFICERS

From the Organization to the Present

President	*Vice-Presidents*	*Secretary*	*Treasurer*
1888. Taylor, Wm. H.	Montgomery, E. E. Carstens, J. H.	Potter, Wm. W.	Werder, X. O.
1889. Montgomery, E. E.	Myers, W. H. Banta, R. L.	Potter, Wm. W.	Werder, X. O.
1890. Wright, A. H.	Rohé, G. H. Hall, R. B.	Potter, Wm. W.	Werder, X. O.
1891. Vander Veer, A.	Hill, H. E. Morris, R. T.	Potter, Wm. W.	Werder, X. O.
1892. McMurtry, L. S.	Ill, Ed. J. Longyear, H. W.	Potter, Wm. W.	Werder, X. O.
1893. Rohé, Geo. H.	Manton, W. P. Hulbert, Geo. F.	Potter, Wm. W.	Werder, X. O.
1894. Carstens, J. H.	Davis, W. E. B. Howitt, H.	Potter, Wm. W.	Werder, X. O.
1895. Price, Joseph	Cordier, Al. H. Peck, G. S.	Potter, Wm. W.	Werder, X. O.
1896. Ross, J. F. W.	Johnston, G. B. Sexton, J. C.	Potter, Wm. W.	Werder, X. O.
1897. Reed, C. A. L.	Douglas, R. Dorsett, W. B.	Potter, Wm. W.	Werder, X. O.
1898. Ill, Edward J.	Ricketts, Ed. Miller, A. B.	Potter, Wm. W.	Werder, X. O.
1899. Hall, R. B.	Dunning, L. H. Crofford, T. J.	Potter, Wm. W.	Werder, X. O.
1900. Davis, W. E. B.	Walker, Ed. Goldspohn, A.	Potter, Wm. W.	Werder, X. O.
1901. Ricketts, E.	Cumston, C. G. Porter, M. F.	Potter, Wm. W.	Werder, X. O.
1902. Dunning, L. H.	Rosenwasser, M. Hayd, H. E.	Potter, Wm. W.	Werder, X. O.
1903. Dorsett, W. B.	Miller, A. B. Haggard, W. D.	Potter, Wm. W.	Werder, X. O.
1904, Longyear, H. W.	Gilliam, D. T. Brown, J. Y.	Potter, Wm. W.	Werder, X. O.
1905. Brown, J. Y.	West, J. N. Simpson, F. F.	Potter, Wm. W.	Werder, X. O.
1906. Morris, R. T.	Crile, G. W. Bonifield, C. L.	Potter, Wm. W.	Werder, X. O.
1907. Zinke, E. G.	Keefe, J. W. Sellman, W. A. B.	Potter, Wm. W.	Werder, X. O.
1908. Humiston, Wm. H.	Sadlier, J. E. Davis, J. D. S.	Potter, Wm. W.	Werder, X. O.
1909. Miller, A. B.	Smith, C. N. Huggins, R. R.	Potter, Wm. W.	Werder, X. O.
1910. Hayd, H. E.	Schwarz, H. Morris, L. C.	Potter, Wm. W.	Werder, X. O.
1911. Werder, X. O.	Frank, L. Tate, M. A.	Zinke, E. G.	Hayd, H. E.
1912. Porter, M. F.	Smith, C. N. Sadlier, J. E.	Zinke, E. G.	Hayd, H. E.
1913. Smith, C. N.	Pantzer, H. O. Branham, J. H.	Zinke, E. G.	Hayd, H. E.
1914. Bonifield, C. L.	Davis, A. B. Sanes, K. I.	Zinke, E. G.	Hayd, H. E.
1915. Pantzer, H. O.	Dickinson, G. K. Pfaff, O. G.	Zinke, E. G.	Hayd, H. E.
1916. Keefe, J. W.	Ill, Chas. L. Pfaff, Orange G.	Zinke, E. G.	Hayd, H. E.
1917. Goldspohn, A.	Bainbridge, W. S. Jones, A. T.	Zinke, E. G.	Hayd, H. E.
1918. Erdmann, J. F.	Weiss, E. A. Yates, H. W.	Zinke, E. G.	Hayd, H. E.
1919. Crile, G. W.	Findley, P. Hadden, D.	Zinke, E. G.	Hayd, H. E.
1920 Schwarz, H.	McClellan, B. R. King, J. E.	Zinke, E. G.	Hayd, H. E.
1921. Skeel, R. E.	Vander Veer, E. A. Bill, A. H.	Zinke, E. G.	Hayd, H. E.

HONORARY FELLOWS

1899.—BALLANTYNE, JOHN WILLIAM, M.D., F.R.C.P.E., F.R.S. Edin. Lecturer on Midwifery and Gynecology, School of Medicine of the Royal Colleges, Surgeons' Hall, Edinburgh; Physician to the Royal Maternity Hospital, Edinburgh; formerly President of the Edinburgh Obstetrical Society; Examiner in Midwifery in the University of Edinburgh; Honorary Fellow of the Glasgow Obstetrical and Gynecological Society. 19 Rothesay Terrace, Edinburgh, Scotland.

1889.—BANTOCK, GEORGE GRANVILLE, MD., F.R.C.S. Ed. Surgeon to the Samaritan Free Hospital. Broad Meadow, King's Norton, Birmingham, England.

1889.—BARBOUR, A. H. FREELAND, M.A., B.S.C., M.D., F.R.C.P. Ed., F.R.S. Ed. Lecturer on Midwifery and Diseases of Women in the Edinburgh Medical School; Assistant Physician to the Royal Maternity Hospital; Assistant Physician for Diseases of Women to the Royal Infirmary; Physician to the Women's Dispensary; Fellow of the Edinburgh and London Obstetrical Societies, and of the British Gynecological Society; Corresponding Fellow of the Royal Academy of Medicine, Turin. 4 Charlotte Square, Edinburgh, Scotland.

1889.—CROOM, SIR J. HALLIDAY, M.D., F.R.C.P.E., F.R.C.S.E., F.R.S.E. Professor of Midwifery in the University of Edinburgh; Consulting Physician to the Royal Infirmary; Physician to the Royal Maternity Hospital; late President of the Royal College of Surgeons, Edinburgh. 25 Charlotte Square, Edinburgh, Scotland.

1891.—FERNANDEZ JUAN SANTOS, M.D. Prado, No. 105, Havana, Cuba.

1889.—FREUND, WILLIAM ALEXANDER, M.D. Emeritus Professor and Director of the Clinic for Diseases of Women in the University of Strassburg. Kleiststrasse 9, Berlin W., Germany.

1912.—GILLIAM, DAVID TOD, M.D. Emeritus Professor of Gynecology, Starling-Ohio Medical College; Gynecologist to St. Anthony Hospital; Member of the American Medical Association, Ohio State Medical Association, Columbus Academy of Medicine; Honorary Member of the Northwestern Ohio Medical Association; Ex-president, Franklin County Medical Society; *Vice President*, 1905. 333 East State Street, Columbus, Ohio.

1921.—HUMISTON, WILLIAM HENRY, M.D. Clinical Professor of Gynecology in the Medical Department of Western Reserve University; Gynecologist in Chief to St. Vincent's Charity Hospital; Consulting Gynecologist to the City Hospital; President of the Ohio State Medical

Society, 1898. *Executive Council,* 1902-1903, 1908, 1910-1911. *President,* 1909. Residence, 2041 East Eighty-ninth Street; Office, 536 Rose Building, Cleveland, Ohio.

1894.—JACOBS, CHARLES, M.D. Professor of the Faculty of Medicine of Brussels; Secretary-General of the Permanent Committee of the Periodic International Congress of Gynecology and Obstetrics; Honorary President of the Belgian Society of Gynecology and Obstetrics; Honorary Fellow of the Gynecological Societies of New York and Chicago; Member of the Southern Surgical and Gynecological Association; Corresponding Member of the Gynecological Society of Paris; Surgeon to the Brussels Polyclinic. 53 Boulevard de Waterloo, Brussels, Belgium.

1890.—MARTIN, AUGUST, M.D., Emeritus Professor of Gynecology in the University of Greifswald. Keithstrasse 14, Berlin W. 62, Germany.

1897.—MATHEWS, JOSEPH MCDOWELL, M.D. Professor of Diseases of the Rectum and Clinical Surgery, Hospital College of Medicine; President of the Kentucky State Board of Health; President American Medical Association, 1899; 404 Consolidated Realty Bldg., Los Angeles, Cal.

1910.—DE OTT, DIMITRIJ OSKAROVIC. Professor of Obstetrics and Gynecology in the Royal Pavloona Clinical Institute of St. Petersburg; President of the Fifth International Congress of Obstetrics and Gynecology. Wassily Ostrow, University Place, Petrograd, Russia.

1891.—PIETRANERA, E., M.D. Professor of Obstetrics in the Medical Department of the National University; Director of the Maternity Branch of the Clinical Hospital. 2711 Calle Rio Adaria, Buenos Ayres, Argentine Republic, S. A.

1889.—SCHULTZE, BERNHARD SIGMUND, M.D. Professor of Gynecology; Director of the Lying-In Institute and of the Gynecological Clinic. 2 Sellierstrasse, Jena, Germany.

1919.—STANTON, BYRON, M.D. Consulting Obstetrician to Christ Hospital since 1888; Member of American Medical Association, American Public Health Association, Academy of Medicine of Cincinnati (Pres. 1903), Cincinnati Obstetrical Society (Pres. 1883); Member of Ohio State Board of Health, 1892 to 1909 (Pres. 1894, 1901, and 1908); Surgeon, 120th Ohio Voluntary Infantry, 1863-4; Surgeon, U. S. Vols., 1865; Superintendent, Ohio State Hospital, Cleveland, 1865-9. Residence, 6248 Savannah Avenue, Cincinnati, Ohio.

1888.—WILLIAMS, SIR JOHN, BART., M.D., F.R.C.P. Blaen Llynant, Aberystwyth, Cardiganshire, Wales.

Total, sixteen Honorary Fellows.

HONORARY FELLOWS, DECEASED

1892.—Boisliniere, L. Ch., A.B., M.D., LL.D., Saint Louis, Mo., 1896.

1890.—Championniere, Just. Lucas, M.D., Paris, France, 1913.

1889.—Charpentier, Louis Arthur Alphonse, M.D., Paris, France, 1899.

1888.—Cordes, Auguste E., M.D., Geneva, Switzerland, 1914.

1890.—Corson, Hiram, M.D., Plymouth Meeting, Pa., 1896.

1889.—Dunlap, Alexander, A.M., M.D., Springfield, O., 1894.

1888.—Edis, Arthur Wellesley, M.D., Lond. F.R.C.S., M.R.S.C.S., London, England, 1893.

1889.—Eklund, Abraham Fredrik, M.D., Stockholm, Sweden, 1898.

1891.—Fisher, George Jackson, A.M., M.D., Sing Sing, N. Y., 1893.

1896.—Gaston, James McFadden, A.M., M.D., Atlanta, Ga., 1903.

1892.—Green, Traill, M.D., LL.D., Easton, Pa., 1897.

1889.—Keith, Thomas, M.D., London, England, 1896.

1889.—Leopold, G., M.D., Dresden, Germany, 1913.

1905.—McGraw, Theodore, A., M.D., Detroit, Mich., 1920.

1894.—Maclein, Donald, M.D., Detroit, Mich., 1903.

1895.—Mastin, Claudius Henry, M.D., LL.D., Mobile, Ala., 1898.

1891.—Moses, Gratz Ashe, M.D., Saint Louis, Mo., 1901.

1905.—Myers, William Herschel, M.D., Fort Wayne, Ind., 1907.

1889.—Nicolaysen, Julius, M.D., Christiania, Norway, 1915.

1889.—Saenger, Max, M.D., Prague, 1903.

1890.—Savage, Thomas, M.D., F.R.C.S. Eng., Birmingham, England, 1907.

1890.—Segond, Paul, M.D., Paris, France, 1913.

1899.—Sinclair, Sir William Japp, A.M., M.D., Manchester, England, 1913.

1894.—Slaviansky, Kronid, M.D., St. Petersburg, Russia, 1898.

1888.—SMITH, J. GREIG, M.A., C.M., M.B., F.R.S.E., Bristol, England, 1897.

1896.—STERNBERG, GEORGE MILLER, A.M., M.D., LL.D., Washington, D. C., 1915.

1899.—STORRS, MELANCTHON, A.M., M.D., Hartford, Conn., 1900.

1888.—TAIT, LAWSON, M.D., LL.D., F.R.C.S.E., Birmingham, England, 1899.

1905.—TAYLOR, WILLIAM HENRY, M.D., *President*, 1888-1889, Cincinnati, Ohio, 1910.

1900.—THORNTON, J. KNOWSLEY, M.B., M.C., Cambridge, England, 1904.

1901.—WEBER, GUSTAV C. E., M.D., LL.D., Willoughby, Ohio, 1912.

1889.—VON WINKEL, F., M.D., Munich, Germany, 1912.

1905.—WYMAN, WALTER, M.D., Washington, D. C., 1911.

CORRESPONDING FELLOWS

1899.—BEUTTNER, OSCAR, M.D. Professor of the Faculty of Medicine; Directeur de la Clinique gynécologique et obstétricale de l'Université de Geneve. Maison Royale, 46, Quai des Eaux-Vives, Geneva, Switzerland.

1914.—DAS, KEDARNATH, M.D. Professor of Midwifery and Gynecology, Campbell Medical School; Obstetrician and Gynecologist, Campbell Hospital, Calcutta; Examiner in Midwifery and Gynecology, Calcutta University; Examiner in Midwifery, College of Physicians and Surgeons, Bengal; Fellow, Royal Society of Medicine, London. 22 Bethune Row, Calcutta.

1903.—ELLIS, GUTHERNE, M.D. Chief Surgeon to the Real Sociedade de Beneficencia Portuguese Hospital. 6 Rua Aurora, S. Paulo, Brazil, S. A.

1891.—GRIFFIN, HERBERT SPOHN, B.A., M.B., M.D., C.M. Surgeon to St. Joseph's Hospital; Gynecologist to Hamilton City Hospital; 157 Main Street, Hamilton, Ontario, Canada.

1914.—HERTOGHE, EUGENE, M.D. Antwerp, Belgium.

1903.—LANE, HORACE MANLEY, M.D., LL.D. President of Mackenzie College, S. Paulo, Brazil. 184 Rua da Consolacao, S. Paulo, Brazil, S. A.

1891.—MACHELL, HENRY THOMAS, M.D., L.R.C.P. Ed. Lecturer on Obstetrics, Women's Medical College; Surgeon to St. John's Hospital for Women; Physician to Victoria Hospital for Sick Children and to Hillcrest Convalescent Home. 95 Bellevue Avenue, Toronto, Ontario, Canada.

1898.—WRIGHT, ADAM HENRY, B.A., M.D. Univ. Toronto, M.R.C.S., Eng. Professor of Obstetrics in the University of Toronto; Obstetrician and Gynecologist to the Toronto General Hospital and Burnside Lying-in Hospital, *President,* 1891. 30 Gerrard Street, East, Toronto, Ont., Canada.

Total, eight Corresponding Fellows.

SENIOR FELLOWS

1917.—Howitt, Henry, M.D., M.R.C.S., Eng. F.A.C.S. Senior Surgeon to the Guelph General and St. Joseph's Hospitals, Guelph. Member of the British, Canadian and Ontario Medical Associations. President of the Guelph Association. Vice-president, 1895. 221 Woolwich St., Guelph, Ontario, Canada.

1911.—Lincoln, Walter Rodman, B.A., M.D. Cocoa, Brevard County, Florida.

1919.—Lott, Henry Stokes, M.D. Member of Staff Attending Surgeons; Instructor of Nurses, Obstetrics and Gynecology, City Hospital. Residence, 810 West End Boulevard. Office, 308 Masonic Temple, Winston-Salem, North Carolina.

1917.—Sutcliffe, John Asbury, A.M., M.D., Capt., M.R.C., U. S. Army. Professor of Genito-urinary Surgery, Indiana University School of Medicine. Consulting Surgeon to St. Vincent's Infirmary; Consultant in Genito-urinary Diseases to the City Hospital and to the Protestant Deaconess' Hospital. Residence, 1121 Central Avenue; Office, 155 East Market Street, Indianapolis, Ind.

1921.—Westmoreland, Willis Foreman, M.D., F.A.C.S. Professor of Surgery at the Atlanta Medical College. Suite 241, Equitable Building, Atlanta, Ga.

ORDINARY FELLOWS

1920.—BABCOCK, WILLIAM WAYNE, A.M., M.D., F.A.C.S. Professor of Surgery, Temple University, Philadelphia; Surgeon, Samaritan, Garretson, and American Stomach Hospitals. Residence, Cloverly Lane, Rydal, Pa.; Office, 2033 Walnut St., Philadelphia, Pa.

1895.—BACON, JOSEPH BARNES, M.D., F.A.C.S. Professor of Rectal Diseases at the Post-Graduate Medical School; Instructor in Clinical Surgery in the Medical Department of Northwestern University, Chicago; Surgeon in Chief St. Francis Hospital, Macomb, Ill.

1911.—BAINBRIDGE, WILLIAM SEAMAN, M.D., A.M., LL.D., M.S., C.M., Sc.D., Commander, M.C., U.S.N.R.F. (on active duty). Adjunct Professor, New York Post-Graduate Medical School, 1902-6; Professor New York Polyclinic Medical School and Hospital since 1906; Surgeon, New York Skin and Cancer Hospital; Attending Surgeon, New York City Children's Hospitals and Schools; Consulting Surgeon Manhattan State Hospital, Booth Memorial Hospital, Salvation Army Home and Hospital of New York City, College of Dental and Oral Surgery of New York, and Tarrytown Hospital, Tarrytown, N. Y.; Consulting Gynecologist, St. Andrew's Hospital (New York) and St. Mary's Hospital, Jamaica, Long Island and the Ossining Hospital, Ossining, N. Y.; Honorary President International Congress for Study of Tumors and Cancers, Heidelberg, Germany, 1906; Foreign Member of the Acadamie Royale de Medicine de Belgique; *Vice-president,* 1917-1918. Official delegate from the U. S. Navy to the Congrés International de Médecine et de Pharmacie Militaries, Bruxelles, 1921. Member of the Permanent Committee appointed by the above Congress. Officier legion d'Honneur. Fellow of the Royal Society of Medicine, London. 34 Gramercy Park, New York City.

1895.—BALDWIN, JAMES FAIRCHILD, A.M., M.D., F.A.C.S. Memb. Volunteer M.C.; Surgeon to Grant Hospital, 125 South Grant Avenue. Residence, 405 E. Town Street, Columbus, Ohio.

1903.—BANDLER, SAMUEL WYLLIS, M.D., F.A.C.S. Instructor in Gynecology in the New York Post-Graduate Medical School and Hospital; Adjunct Gynecologist to the Beth Israel Hospital. Residence and Office, 134 West Eighty-seventh Street, New York, N. Y.

1911.—BARRETT, CHANNING W., M.D., F.A.C.S. Professor of Gynecology and Head of Division of Gynecology, University of Illinois Med-

ical School, Gynecologist and head of Department of Gynecology, Cook County Hospital. 4245 North Ashland Ave., Chicago, Ill.

1913.—BAUGHMAN, GREER, M.D., F.A.C.S., Capt., M.C., U. S. Army, Honorably Discharged. Professor of Obstetrics, Medical College of Virginia; Visiting Obstetrician to the Stuart Circle Hospital, Virginia Hospital, and to the Memorial Hospital, Richmond, Virginia; Member of the Southern Surgical and Gynecological Association; Vice-president of the Medical Society of Virginia, 1905; President of the Richmond Academy of Medicine and Surgery, 1917; Member of the Tri-State Medical Association of Virginia and the Carolinas; Richmond Academy of Medicine and Surgery, Southern Medical Association and the American Medical Society. Residence and Office, 26 North Laurel St., Richmond, Virginia.

1907.—BELL, JOHN NORVAL, M.D., F.A.C.S., Capt., M.C., U. S. Army. Associate Professor of Obstetrics, Detroit College of Medicine and Surgery; Attending Obstetrician, Providence Hospital; Consulting Obstetrician, Woman's and Booth Memorial Hospitals; Consulting Surgeon, Harper Hospital. Residence, 203 Pallister Avenue; Office, 1149 David Whitney Bldg., Detroit, Mich.

1914.—BILL, ARTHUR HOLBROOK, A.M., M.D., F.A.C.S. Associate Professor and Head of the Department of Obstetrics, School of Medicine, Western Reserve University; Obstetrician in Chief to the Maternity Hospital of Cleveland; Visiting Obstetrician and Department Head, Cleveland City Hospital; Director of the Out-Patient Obstetrical Department, Western Reserve University; Consulting Obstetrician to the Elyria Memorial Hospital, Elyria, Ohio. Residence, 1804 East Ninety-third Street; Office, 503 Osborn Building, Cleveland, Ohio.

1900.—BONIFIELD, CHARLES LYBRAND, M.D. Professor of Gynecology, Medical Department of the University of Cincinnati. Member and Ex-President, Cincinnati Academy of Medicine, Cincinnati Obstetrical Society, Ohio State Medical Association and Ohio Clinical Association. Member of American Medical Association, Southern Surgical and Gynecological Society. *President*, 1914. Residence, 1763 East McMillan Street; Office, 409 Broadway, Cincinnati, Ohio.

Founder.—BOYD, JAMES PETER, A.M., M.D. Emeritus Professor of Obstetrics and Diseases of Children in the Albany Medical College; Consulting Obstetrician to the Albany Hospital; Fellow of the British Gynecological Society; Fellow of the Royal Society of Medicine. 152 Washington Avenue, Albany, N. Y.

1889.—BRANHAM, JOSEPH H., M.D. Professor of Surgery in the Maryland Medical College; Surgeon to the Franklin Square Hospital. 2200 Eutaw Place, corner Ninth Avenue, Baltimore, Md.

1912.—Brown, George Van Amber, M.D. Gynecologist to Providence Hospital; Clinical Instructor in Gynecology, Detroit College of Med. and Surg.; Member Wayne Co. and Michigan State Med. Soc.; Member American Medical Association; President Northern Tri-State Med. Soc. 1918. Residence, 1690 Atkinson Avenue; Office, 13300 Woodward Avenue, Detroit, Mich.

1914.—Brown, William Mortimer, M.D., F.A.C.S. Obstetrician to Rochester General Hospital. Residence and Office, 1776 East Ave., Rochester, N. Y.

1918.—Burckhardt, Louis, M.D. Professor of Obstetrics, Indiana University. Residence, 3159 North Pennsylvania Street; Office, 621 Hume-Mansur Building, Indianapolis, Ind.

1908.—Buteau, Samuel H., M.D., F.A.C.S. Former member of California State Board of Medical Examiners; formerly Visiting Surgeon to Almeda County Hospital. Residence, 1052 Telegraph Avenue; Office 1155 Broadway, Oakland, Cal.

1914.—Chandler, George Fletcher, M.D., F.A.C.S., Maj., M.C., U. S. Army. Surgeon to the Kingston City Hospital. Residence and Office, 11 East Chestnut St., Kingston, N. Y.

1915.—Clark, Edmund Dougan, M.D., F.A.C.S., Lt. Col. M.C., U. S. A., Commander of Base Hospital No. 32, A. E. F. Professor of Surgery and Secretary of the Faculty, Indiana University School of Medicine; Consulting Surgeon, Indianapolis City Hospital; Visiting Surgeon, Methodist Hospital. Residence, 1321 N. Meridian St.; Office, Hume-Mansur Bldg., Indianapolis, Ind.

1920.—Condit, William Henry, M.D., B.S. Asst. Professor of Obstetrics and Gynecology, University of Minnesota. Residence, 2205 Kenwood Place; Office, Donaldson Bldg., Minneapolis, Minn.

1901.—Crile, George W., A.M., M.D., F.A.C.S., Col. M.C., U. S. Army. Senior Consultant in Surgical Research, American Expeditionary Forces; Professor of Surgery, Western Reserve Medical College; Visiting Surgeon to Lakeside Hospital. *Vice-president*, 1907; *President*, 1920. Residence, 2620 Derbyshire Road, Cleveland Heights; Office, Cleveland Clinic, Euclid at East Ninety-third Street, Cleveland, Ohio.

1905.—Crossen, Harry Sturgeon, M.D., F.A.C.S. Clinical Professor of Gynecology in Washington University; Gynecologist to Washington University Hospital; Associate Gynecologist to Mullanphy Hospital; Consulting Gynecologist to Bethesda, City and Female Hospitals. Residence, 4477 Delmar Avenue; Office, 310 Metropolitan Building, Saint Louis, Mo.

1912.—CROTTI, ANDRÉ, M.D., F.A.C.S. Capt., M.C., U. S. Army. Professor of Clinical Surgery, Ohio State University; Surgeon to Grant Hospital, Children's Hospital and to St. Francis Hospital. Residence, 1728 E. Broad Street; Office, 151 E. Broad Street, Columbus, Ohio.

1912.—DARNALL, WILLIAM EDGAR, A.B., M.D., F.A.C.S. Gynecologist, Atlantic City Hospital; Consulting Surgeon to North American Children's Sanitarium for the Treatment of Surgical Tuberculosis, and Home for Incurables, Longport, New Jersey; Surgeon to the Max and Sarah Bamburger Home, Longport; *Vice-president* American Medical Association, 1914. Residence and Office, 1704 Pacific Ave., Atlantic City, N. J.

1911.—DAVIS, ASA BARNES, M.D., F.A.C.S. Attending Surgeon of the Society of the Lying-in Hospital of the City of New York; Consulting Gynecologist to the Vassar Brothers' Hospital, Poughkeepsie, N. Y. 42 E. 35th Street, New York.

1915.—DAVIS, JAMES ETHELBERT, A.M., M.D. Professor of Pathology, Detroit College of Medicine and Surgery; Director of Laboratories, Providence and Woman's Hospital; Pathologist St. Mary's Hospital; Consulting Pathologist Michigan State Board of Health; President Wayne County Medical Society; Member—The American and Canadian Section of the International Association of Medical Museums; American Medical Association; Acting Secretary, 111 Josephine Ave., Detroit, Michigan.

1903.—DAVIS, JOHN D. S., M.D., LL.D., F.A.C.S. Professor of Surgery in the Post-Graduate School of Medicine of the University of Alabama; Surgeon to Hillman Hospital; Surgeon to Davis Infirmary; ex-President Jefferson County Medical Society; *Vice-president,* 1905; *Vice-president,* 1909. 2031 Avenue G, Birmingham, Ala.

1910.—DICE, WILLIAM GORDON, A.B., M.D. Obstetrician to Flower and Mercy Hospitals. 240 Michigan Street, Toledo, Ohio.

1909.—DICKINSON, GORDON K., M.D., F.A.C.S. Attending Surgeon to the Jersey City Hospital, and Christ Hospital, Jersey City; Consulting Surgeon, Bayonne City Hospital, North Hudson Hospital, Weehawken, and the Stumpf Memorial Hospital, Kearney; *Vice-president,* 1915-1916; Past-president, Medical Society of the State of New Jersey, 1919-1920. 280 Montgomery St., Jersey City, N. J.

1920.—DORSETT, EDWARD LEE, M.D., F.A.C.S., Capt. M.C., U. S. A., 1918-1919. Gynecologist to the Missouri Baptist Sanitarium, Evangelical Deaconess Hospital, and St. Louis City Hospital. Office 509 University Club Bldg., St. Louis. Mo.

1920.—DOUGLASS, FRED MELVIN, M.D. Surgeon to St. Vincent's Hospital; Surgeon to Lucas County Hospital. Residence, 2046 Franklin Ave.; Office, 421 Michigan St., Toledo, Ohio.

1904.—ELBRECHT, OSCAR H., PH. B., M.D., F.A.C.S. Formerly Superintendent and Surgeon in Charge, St. Louis Female Hospital; Visiting Surgeon, St. Louis City Hospital; Consulting Gynecologist, Missouri Pacific Hospital; Consulting Surgeon to St. Louis Maternity Hospital and former Chief of Staff; Consulting Surgeon, Bethesda Hospital; Member of Southern Surgical and Gynecological Association. Residence, Buckingham Hotel; Office, 423 Metropolitan Building, St. Louis, Mo.

1906.—ERDMANN, JOHN FREDERICK, M.D., F.A.C.S. Professor of Surgery, N. Y. Post-Graduate Hospital and Medical School; Attending Surgeon to Gouverneur Hospital and Post-Graduate Hospital; Consulting Surgeon to St. John's Riverside Hospital, Yonkers, N. Y.; Mt. Vernon General Hospital, Mt. Vernon, N. Y.; Greenwich General Hospital, Greenwich, Conn.; Nassau Hospital, Mineola, L. I. 60 West Fifty-second Street, New York, N. Y.

1920.—FARR, ROBERT EMMETT, M.D. Attending Surgeon, St. Mary's Hospital. Residence, 2433 S. Bryant St.; Office, 301 Physicians & Surgeons Bldg., Minneapolis, Minn.

1911.—FINDLEY, PALMER, B.E., M.D., F.A.C.S. Professor of Gynecology, College of Medicine, University of Nebraska. 3602 Lincoln Boulevard, Omaha, Neb.

1910.—FOSTER, CURTIS SMILEY, A.B., M.D., F.A.C.S. Gynecologist to the Western Pennsylvania Hospital, Pittsburgh. Residence, 5749 Ellsworth Avenue; Office, 308 Diamond Bank Building, Pittsburgh, Pa.

1903.—FRANK, LOUIS, M.D., F.A.C.S. Professor of Abdominal and Pelvic Surgery, Medical Department, University of Louisville, Surgeon Louisville City Hospital; Surgeon to John N. Norton Memorial Infirmary; Consulting Surgeon, Children's Free Hospital; President Mississippi Valley Medical Association, 1912; *Executive Council,* 1913. Residence, 1321 Fourth Ave.; Office, 400 The Atherton, Louisville, Kentucky.

1912.—FURNISS, HENRY DAWSON, M.D., F.A.C.S., Professor of Gynecology, New York Post-Graduate Hospital; Attending Gynecologist, New York Post-Graduate Hospital; Consulting Gynecologist, All Souls Hospital, Morristown; Consulting Gynecologist, New Rochelle Hospital; Consulting Gynecologist, St. Agnes Hospital, White Plains, N. Y.; Consulting Cystoscopist, New York Infirmary for Women; Fellow, New York Academy of Medicine, New York Medico-Surgical Society; New York Obstetrical Society, New York State and County Medical

Societies, American Medical Association, American Urological Society. Office, 54 East Forty-eighth Street, New York, N. Y.

1921.—GARNETT, ALEXANDER Y. PEYTON, M.D. Obstetrician, Garfield Hospital, Associate Professor of Obstetrics, Georgetown University; Obstetrician, Georgetown Hospital. Residence, 1612 Twenty-first Street; Office, 1824 Massachusetts Avenue, Washington, D. C.

1902.—GILLETTE, WILLIAM J., M.D. Professor of Abdominal Surgery and Gynecology in the Toledo Medical College; Surgeon to Robinwood Hospital. 1613 Jefferson Street, Toledo, Ohio.

1895.—GOLDSPOHN, ALBERT, M.S., M.D., F.A.C.S. Professor of Gynecology, Post-Graduate Medical School; Surgeon in Chief of Evangelical Deaconess Hospital. *Vice-president,* 1901. Residence, 2118, Office, 2120 Cleveland Avenue, Chicago, Ill.

1912.—GOODMAN, SYLVESTER JACOB, Ph.G., M.D., F.A.C.S. Surgeon and Obstetrician to Grant Hospital; Obstetrician, Mercy Hospital; Major M.C., U. S. Army, Honorable Discharge. Residence, 1718 Franklin Avenue; Office, 121 South Sixth Street, Columbus, Ohio.

1913.—HADDEN, DAVID, B.S., M.D., F.A.C.S. Residence, 6150 Mendocino Ave.; Office, Oakland Bank and Savings Bldg., Oakland, Cal.

1900.—HAGGARD, WILLIAM DAVID, JR., M.D., F.A.C.S. Professor of Gynecology, Medical Department University of Tennessee; Professor of Gynecology and Abdominal Surgery, University of the South (Sewanee); Gynecologist to the Nashville City Hospital; President of the Nashville Academy of Medicine; Secretary of the Section on Diseases of Women and Obstetrics, American Medical Association, 1898; Fellow (and President) of the Southern Surgical and Gynecological Association; Member of the Alumni Association of the Women's Hospital, N. Y. *Vice-president,* 1904. 148 Eighth Avenue, North, Nashville, Tenn.

1906.—HALL, JOSEPH ARDA, M.D., F.A.C.S., Lieut. Col., M.C., U. S. Army. Clinical Assistant in Gynecology at the Miami Medical College, Cincinnati. 628 Elm Street, Cincinnati, Ohio.

1889.—HALL, RUFUS BARTLETT, A.M., M.D., F.A.C.S. Professor of Clinical Gynecology in the Ohio-Miami Medical College, Medical Department of University of Cincinnati; Gynecologist to the Cincinnati Hospital; Surgeon in charge of the Hall Hospital; Member of the British Medical Society; of the Southern Surgical and Gynecological Association; of the American Medical Association; of the Ohio State Medical Society (President, 1900); of the Cincinnati Academy of Medicine (President, 1909); of the Cincinnati Obstetrical Society (ex-President). *Vice-president,* 1891; *President,* 1900; *Executive Council,* 1904-1909. Berkshire Building, 628 Elm Street, Cincinnati, Ohio.

1902.—HAMILTON, CHARLES SUMNER, A.B., M.D., F.A.C.S. Professor of the Principles of Surgery in Starling Medical College; Surgeon to Mt. Carmel and the Children's Hospitals. 188 E. State St., Columbus, Ohio.

1921.—HARPER, PAUL TOMPKINS, M.D., Ph.B. Clinical Professor of Obstetrics (in Charge of Teaching), Albany Medical College; Attending Obstetrician, Anthony N. Brady Maternity Home; Obstetrician, Albany Hospital. Residence and Office, 289 State Street, Albany, N. Y.

1910.—HARRAR, JAMES AITKEN, M.D., F.A.C.S. Attending Surgeon to the Lying-in Hospital of the City of New York. Residence and Office, 100 East 66th Street, New York, N. Y.

1894.—HAYD, HERMAN EMIL, M.D., M.R.C.S. Eng., F.A.C.S. Surgeon to the German Deaconess Hospital; Surgeon to the German Hospital. *Vice-president*, 1903; Executive Council, 1908-1910; *President*, 1911. 493 Delaware Avenue, Buffalo, N. Y.

1908.—HEDGES, ELLIS W., A.B., M.D., F.A.C.S. Visiting Surgeon to Muhlenberg Hospital, Plainfield, N. J. 703 Watchung Avenue, Plainfield, N. J.

1919.—HEWITT, HERBERT WINDHAM, M.D. Attending Surgeon, Grace Hospital; Attending Surgeon, Children's Free Hospital; Associate Professor of Clinical Surgery, Detroit, College of Medicine. Residence, 79 Rowena Street; Office, 1131 David Whitney Bldg., Detroit, Mich.

1910.—HILL, IRA LEON, A.B., M.D. Clinical Instructor of Obstetrics at Cornell University Medical College; Visiting Obstetrician to the Red Cross Hospital; Attending Obstetrician to Sydenham Hospital. 616 Madison Avenue, New York, N. Y.

1905.—HUGGINS, RALEIGH RUSSELL, M.D., F.A.C.S. Surgeon to St. Francis Hospital. *Vice-president*, 1910. 1018 Westinghouse Building, Pittsburgh, Pa.

1901.—ILL, CHARLES L., M.D., F.A.C.S. Surgeon to the German Hospital; Gynecologist to St. Michael's and Surgeon to St. Barnabas's Hospitals, Newark; Gynecologist to All Souls' Hospital, Morristown. 188 Clinton Avenue, Newark, N. J.

Founder.—ILL, EDWARD JOSEPH, M.D., F.A.C.S. Emeritus Surgeon to the Woman's Hospital; Emeritus Medical Director of St. Michael's Hospital; Gynecologist and Supervising Obstetrician to St. Barnabas's Hospital; Consulting Gynecologist to the Beth Israel Hospital of Newark, N. J., to All Souls' Hospital, and Memorial Hospital, Morristown, N. J., and to the Mountain Side Hospital, Montclair, N. J.; Perth Amboy City Hospital, Muhlenberg Hospital (Plainfield), Somerset Hos-

pital (Somerville), Skillman Home for Epileptics, Stumpf Memorial Hospital (Kearney), St. Elizabeth's Hospital (Elizabeth), and St. James Hospital (Newark); Member of the Southern Surgical and Gynecological Association; Vice-president from New Jersey of the Pan-American Medical Congress of 1893; President of the Medical Society of the State of New Jersey, 1907. *Vice-president,* 1893; *President,* 1899; *Executive Council,* 1901-1903. 1002 Broad Street, Newark, N. J.

1906.—JONAS, ERNST, M.D., F.A.C.S. Clinical Professor of Surgery in Washington University Medical School; Surgeon in Charge of the Surgical Clinic at the Washington University Hospital; Gynecologist to the St. Louis Jewish Hospital; Visiting Surgeon to St. Louis City Hospital; Consulting Surgeon to St. John's Hospital; Surgeon to the Martha Parsons Free Hospital for Children. Residence, 4495 Westminster Place; Office, 465 North Taylor Avenue, St. Louis, Mo.

1910.—JONES, ARTHUR THOMS, M.D., F.A.C.S. Visiting Surgeon to Memorial Hospital, Pawtucket, R. I. and to Rhode Island State Hospital for the Insane, Howard, R. I.; Consulting Surgeon to St. Joseph's Hospital, Providence; and to Woonsocket Hospital, Woonsocket, R. I. Residence, 81 Elm Grove Avenue; Office, 131 Waterman St., Providence, R. I.

1902.—KEEFE, JOHN WILLIAM, M.D., LL.D., F.A.C.S. Attending Surgeon to the Rhode Island Hospital and Providence City Hospital; Consulting Surgeon to the St. Joseph's Hospital, Providence Lying-In Hospital, Memorial Hospital, Pawtucket and Woonsocket Hospital. *Vice-president,* 1908. *Executive Council,* 1911. 262 Blackstone Boulevard, Providence, R. I.

1910.—KENNEDY, JAMES W., M.D., F.A.C.S. Associate Gynecologist and Obstetrician to the Philadelphia Dispensary, 1409 Spruce Street, Philadelphia, Pa.

1911.—KING, JAMES E., M.D., F.A.C.S. Professor of Clinical Gynecology, Medical Department, University of Buffalo, New York; Attending Gynecologist, Buffalo General and Erie County Hospital and Good Samaritan Dispensary; Fellow Royal Society of Medicine, London, England; Fellow of Am. Gyn. Soc., 1248 Main Street, Buffalo, N. Y.

1908.—KIRCHNER, WALTER C. G., A.B., M.D., F.A.C.S., Capt.; M.C., U. S. Army. Formerly Superintendent and Surgeon in charge of the St. Louis City Hospital. Visiting Surgeon City Hospital, Consulting Surgeon St. John's Hospital. Office, 508 Metropolitan Building, St. Louis, Mo.

1918.—KOSMAK, GEORGE W., A.B., M.D., F.A.C.S. Attending Surgeon, Lying-In Hospital, N. Y. Consulting Obstetrician, Booth Memorial Hospital, N. Y. Editor, American Journal of Obstetrics and Gynecology. Residence and Office, 23 East 93rd Street, New York City.

1898.—LANGFITT, WILLIAM STERLING, M.D., F.A.C.S. Surgeon in chief to St. John's Hospital. Office, 8047 Jenkins Building, Pittsburgh, Pa.

1921.—LANKFORD, BURNLEY, M.D. Secretary of General Staff, Norfolk Protestant Hospital; Chief of Obstetrical Division. Residence, 520 Shirley Avenue; Office, 246 West Freemason St., Norfolk, Va.

1914.—LEIGHTON, ADAM P., JR., L. M. (Dublin), M.D. Attending Obstetrician to Dr. Leighton's Maternity Hospital, Portland; Gynecologist to Edward Mason Dispensary, Portland; Chairman of the Maine State Board of Registration of Medicine. Consulting Obstetrician to the Webber Hospital, Biddeford; Consulting Obstetrician to the Gardiner General Hospital, Gardiner. Residence, 261 Western Promenade; Office, 192 State Street; Private Hospital, 109 Emery Street, Portland, Maine.

1915.—LITZENBERG, JENNINGS, A.B., M.D., F.A.C.S. Professor of Gynecology and Obstetrics, University of Minnesota. Residence, 3137 Park Avenue; Office, Donaldson Building, Minneapolis, Minn.

1911.—LOTHROP, EARL P., A.B., M.D., F.A.C.S. Gynecologist to the Buffalo Woman's Hospital; Consulting Surgeon to Columbus Hospital, Buffalo; Surgeon to the J. N. Adams Memorial Hospital for Tuberculosis, Perrysburg, N. Y. 153 Delaware Avenue, Buffalo, N. Y.

1913.—LYNCH, JEROME MORLEY, M.D., F.A.C.S. Professor Rectal and Intestinal Diseases, New York Polyclinic; Consulting Surgeon Nassau Hospital, Mineola, L. I.; Attending Surgeon St. Mary's Hospital, Hoboken, N. J.; Member New York State and County Societies, American Medical Association, American Proctologic Society, North Western Medical and Surgical Society; Surgeon Medical Reserve, U. S. N. Residence and Office, 205 East 61st St., New York City.

1910.—McCLELLAN, BENJAMIN RUSH, A.B., A.M., M.D., F.A.C.S. Capt., M.C., U. S. Army, Member American Medical Association; ex-President Ohio State Medical Society; Surgeon to McClellan Hospital. Residence, 636 South Detroit Street; Office, 7 East Second Street, Xenia, Ohio.

1910.—McPHERSON, ROSS, A.B., M.D., F.A.C.S. Attending Surgeon of the Lying-in Hospital of the City of New York; Consulting Obstetrician of the Caledonian Hospital in Brooklyn. Office, 125 East Thirty-ninth Street; Residence, 45 East Sixty-second Street, New York, N. Y.

Founder.—MANTON, WALTER PORTER, M.D., F.A.C.S. Director of Department and Professor of Obstetrics, Detroit College of Medicine and Surgery; Consulting (Emeritus) Gynecologist to Harper Hospital; Gynecologist Pontiac and Traverse City State Hospitals; Consulting Gynecologist to St. Joseph's Retreat; Consulting Director, Herman Kiefer Hospital, Maternity Dept.; Formerly President of the Medical Board

and Visiting Obstetrician Woman's Hospital and Infants' Home; President Detroit Academy of Medicine, 1892-1894; President Detroit Gynecological Society, 1890; President Wayne County Medical Society, 1908-1909; Chairman, Section on Obstetrics and Diseases of Women, 1909; Fellow of the Royal Medical Society, the American Gynecological Society, the American College of Surgeons; the Zoological Society of London, etc. *Vice-president,* 1894. 32 Adams Avenue, W., Detroit, Mich.

1914.—MEEKER, HAROLD DENMAN, A.B., M.D., F.A.C.S., Com., M.C., U. S. N. R. F. Professor of Surgery, Polyclinic Medical School and Hospital, New York; Visiting Surgeon to Park Hospital, New York. Residence, 420 West End Ave.; Office, 47 East 57th St., New York, N. Y.

1920.—MENDENHALL, ARTHUR MONROE, B.S., M.D. Instructor in Obstetrics, Indiana University Medical School. Residence, 3304 Broadway; Office, 333 Newton-Claypool Bldg., Indianapolis, Ind.

Founder.—MILLER, AARON BENJAMIN, M.D., F.A.C.S. Professor of Gynecology in the Medical Department of Syracuse University; Gynecologist to St. Joseph's Hospital; Consulting Gynecologist to Hospital for Women and Children; Gynecologist to Dispensary. *Vice-president,* 1899, 1904; *President,* 1910; *Executive Council,* 1911. 326 Montgomery Street, Syracuse, N. Y.

1905.—MILLER, JOHN D., M.D., F.A.C.S. Professor of Gynecology, University of Cincinnati; Director of Gynecologic Clinic (Out-patient's Dept.), Cincinnati General Hospital; Gynecologist of Good Samaritan and Cincinnati General Hospitals. Residence, N. E. cor. Clifton and McMillan Streets; Office, N. W. cor. Eighth and Elm Streets, Cincinnati, Ohio.

1921.—MONTGOMERY, EDWARD BREWER, M.D., F.A.C.S. Residence, 1461 Vermont Street; Office, 134 North 8th Street, Quincy, Ill.

1911.—MOOTS, CHARLES W., B.S., M.D., F.A.C.S. Commander, U. S. N. R. F. Gynecologist to Flower Hospital; President of Academy of Medicine of Toledo and Lucas County, 1912. Residence, The Belvedere Apts.; Office, 225 Michigan Street, Toledo, Ohio.

1921.—MORAN, JOHN FRANCIS, A.B., M.D. Professor of Obstetrics, Georgetown University School of Medicine; Obstetrician, Georgetown University Hospital, Columbia Hospital for Women, and Washington Asylum Hospital. Residence and office, 2426 Pennsylvania Ave., N. W., Washington, D. C.

1907.—MORIARTA, DOUGLAS C., M.D., F.A.C.S. Senior Surgeon to Saratoga Hospital; Surgeon in chief to Saint Christina's Hospital for Children; Director of State Experimental Station at Saratoga. 511 Broadway, Saratoga Springs, N. Y.

1890.—MORRIS, ROBERT TUTTLE, A.M., M.D., F.A.C.S., Maj., M.R.C., U. S. Army. Professor of Surgery in the New York Post-Graduate Medical School and Hospital. *Vice-president,* 1892; *Executive Council,* 1906, 1908-1911; *President,* 1907. 114 East 54th Street, New York, N. Y.

1918.—MOSHER, GEORGE CLARK, A.M., M.D., F.A.C.S. Senior Obstetrician of the Kansas City General and Christian Hospitals; Consulting Obstetrician, Swedish, St. Mary's and Bethany Hospitals; Formerly Professor of Obstetrics and Gynecology, Head of Dept., Medical School of University of Kansas; Founder and ex-President, Kansas City Obstetrical Society. Residence, 361 Locust Street; Office, 605 Bryant Building, Kansas City, Mo.

1896.—NOBLE, GEORGE HENRY, M.D., D.C.L., F.A.C.S. Gynecologist to the Grady Hospital; Secretary to the Section on Obstetrics and Gynecology of American Medical Association, 1897; Professor of Clinical Gynecology, Atlanta Medical College (Emery University); Member of the Southern Surgical and Gynecological Association. 186 South Pryor Street, Atlanta, Ga.

1903.—NOBLE, THOMAS BENJAMIN, M.D. Professor of Abdominal Surgery in the Central College of Physicians and Surgeons; Consultant in the Diseases of Women at the City Hospital, City Dispensary, and Protestant Deaconess's Hospital, Indianapolis. 720 Newton Claypool Building, Indianapolis, Ind.

1907.—OLMSTED, INGERSOLL, M.D., F.A.C.S. Surgeon to the City and St. Joseph's Hospitals, Hamilton, Ont. 215 South James St., Hamilton, Ontario, Canada.

1899.—PANTZER, HUGO OTTO, A.M., M.D., F.A.C.S. Past Professor, Surgical Pathology and Clinical Gynecology, in the Central College of Physicians and Surgeons; Past Professor Clinical Gynecology, Indiana Medical College, Medical Department of Purdue University; Late Professor of Clinical Gynecology in the Indiana Medical College, Medical Department of Indiana University; Gynecologist to Methodist Hospital; Past President of Indianapolis Medical Society; Member of Indiana State Association and American Medical Association. *President,* 1915. 601 Hume-Mansur Bldg., Indianapolis, Ind.

1916.—PECK, GEORGE AUGUSTUS, M.D., F.A.C.S. Attending Surgeon, New Rochelle Hospital, New Rochelle, N. Y.; Consulting Surgeon, Westchester County Hospital, New York. Residence and Office, 189 Centre Ave., New Rochelle, N. Y.

1916.—PERCY, JAMES FULTON, A.M., M.D., F.A.C.S., Maj., M.C., U. S. Army. Office, 2541 First St., San Diego, Cal.

1899.—PFAFF, ORANGE G., M.D. Adjunct Professor of Obstetrics and Diseases of Women in the Medical College of Indiana; Gynecologist to the City, Deaconess's, and St. Vincent's Hospitals, 1337 North Pennsylvania Street, Indianapolis, Ind.

1921.—PFEIFFER, WILLIAM, M.D., F.A.C.S. Obstetrician in Chief, Brownsville and East New York Hospital; Obstetrician and Gynecologist, Kings County Hospital; Assistant Obstetrician and Gynecologist, Holy Family Hospital. Residence and Office, 368 McDonough Street, Brooklyn, N. Y.

1920.—POLAK, JOHN OSBORN, B.S., M.D., M.Sc. Professor of Obstetrics and Gynecology, Long Island College Hospital; Attending Obstetrician and Gynecologist to the Hospital; Attending Gynecologist to the Jewish Hospital; Consulting Gynecologist, Coney Island, Bushwick, Peoples, Williamsburg, and South Hampton Hospitals; Consulting Obstetrician to the Methodist Episcopal Hospital. Residence, 287 Clinton Ave.; Office, 20 Livingston St., Brooklyn, N. Y.

1898.—PORTER, MILES F., M.D., F.A.C.S. Chairman of the District Conscript Board No. 2, of Indiana. Professor of Surgery in the Indiana University School of Medicine; ex-President Indiana State Medical Society. *Vice-president,* 1902; *President,* 1912-1913. 2326 Fairfield Ave., Ft. Wayne, Ind.

1902.—PORTER, WILLIAM D., M.D. Professor of Clinical Obstetrics, Medical College, University of Cincinnati; Assistant Director, Obstetrical Department, Cincinnati General Hospital. Residence, 3031 Reading Road; Office, 1 Melrose Building, Cincinnati, Ohio.

1914.—POTTER, IRVING WHITE, M.D. Attending Obstetrician, St. Mary's Maternity Hospital; Instructor of Obstetrics, Medical Department, University of Buffalo; Attending Obstetrician, German Deaconess Hospital. Residence and Office, 420 Franklin St., Buffalo, N. Y.

1903.—POUCHER, JOHN WILSON, M.D., F.A.C.S. Consulting Surgeon, Highland Hospital (Beacon, N. Y.), and Hudson River State Hospital (Poughkeepsie); Chief of Staff and Attending Surgeon, Bowne Memorial Hospital, and St. Francis Hospital (Poughkeepsie). 339 Mill Street, Poughkeepsie, N. Y.

1919.—QUIGLEY, JAMES KNIGHT, A.B., M.D. Associate Obstetrician to the Rochester General Hospital; Member Alumni Society Lying-in Hospital of the City of New York. Residence, 400 Westminster Road; Office, 303 Alexander Street, Rochester, N. Y.

1904.—REDER, FRANCIS, M.D., F.A.C.S. Visiting Surgeon to St. Louis City Hospital; Consulting Surgeon to St. John's Hospital. Residence, 6346 Pershing Avenue; Office, 415 University Club Building, St. Louis, Mo.

Founder.—REED, CHARLES ALFRED LEE, A.M., M.D., F.A.C.S. Maj., M.C., U. S. Army. Consulting Gynecologist, Cincinnati General Hospital; President, American Medical Association, 1900-1; Fellow, British Gynecological Society; Chevalier Legion of Honor, France; Fellow, National Academy of Medicine of Peru; President, Seventh Pan-American Medical Congress. *President*, 1898. Residence, 3544 Biddle Avenue; Office, 5 West Eighth Street, Cincinnati, Ohio.

1913.—RONGY, ABRAHAM JACOB, M.D., F.A.C.S. Attending Gynecologist, Lebanon Hospital; Attending Surgeon, Jewish Maternity Hospital; Consulting Gynecologist, Rockaway Beach Hospital. Residence and Office, 345 West 88th Street, New York City.

1909.—ROSENTHAL, MAURICE I., M.D., F.A.C.S. Surgeon to Saint Joseph's Hospital. 336 W. Berry Street, Fort Wayne, Ind.

1920.—ROYSTON, GRANDISON DELANEY, M.D. Instructor in Clinical Obstetrics, Washington University Medical School; Assistant in Obstetrics, Barnes Hospital; Visiting Staff, St. Louis Maternity Hospital; Chief of Clinic on Obstetrics and Gynecology, Washington University Dispensary. Residence, 3705 Lindell Ave.; Office, Wall Bldg., St. Louis, Mo.

1920.—RUCKER, MARVIN PIERCE, A.M., M.D. Associate in Obstetrics, Medical College of Virginia. Residence, 2020 Monument Ave.; Office, 400 N. Lombardy, Richmond, Va.

1902.—RUNYAN, JOSEPH PHINEAS, M.D. Division Surgeon to the Choctaw, Oklahoma and Gulf Railroad; Secretary of the Arkansas State Medical Association, President, 1904. State Bank Bldg., Little Rock, Ark.

1906.—RUTH, CHARLES EDWARD, M.D., F.A.C.S., Lt. Col. M.R.C., U. S. Army. Professor of Surgery and Clinical Surgery in the Keokuk Medical College (College of Physicians and Surgeons); Surgeon, Iowa M. E. Hospital; Chief of Surgical Service Base Hospital, Camp Dodge, Ia.; Chief Surgical Service of General Hospital No. 2, Baltimore, Md.; Commander, Post Hospital, Fort Wm. McKinley, Rizal, P. I. Iowa Building, Des Moines, Iowa.

1903.—SADLIER, JAMES EDGAR, MD., F.A.C.S. Attending Surgeon, St. Francis Hospital, Poughkeepsie, N. Y.; Surgeon-in-Chief, The Sadlier Hospital, Poughkeepsie, N. Y.; Consulting Surgeon, Highland Hospital, Beacon, N. Y. *Vice-president*, 1909. Residence and Office, 295 Mill Street, Poughkeepsie, N. Y.

1909.—SANES, KAY ISADORE, M.D., F.A.C.S., Capt., M.C., U. S. Army. Gynecologist to the West Penn Hospital; Consulting Gynecologist to the Montefiore Hospital, Pittsburgh. Residence, 250 South Atlantic Ave.; Office, Jenkins Building, Pittsburgh, Pa.

1910.—SCHILDECKER, CHARLES BUSHFIELD, M.D. Assistant Gynecologist to Western Pennsylvania Hospital; Coroner's Physician of Allegheny County. Residence, 414 Rebecca Street; Office, 1105 Park Building, Pittsburgh, Pa.

1921.—SCHMITZ, HENRY, M.D., A.M., F.A.C.S. Professor of Gynecology, and Head of Department, Loyola University School of Medicine; Assistant Surgeon, St. Mary Hospital; Assistant Gynecologist, Cook County Hospital. Residence, 3051 Logan Blvd.; Office, 25 East Washington St., Chicago, Ill.

1904.—SCHWARZ, HENRY, M.D., F.A.C.S. Professor of Obstetrics, Medical Department of Washington University. *Vice-president,* 1911. 440 North Newstead Avenue, St. Louis, Mo.

1918.—SCHWARZ, OTTO H., M.D. Instructor in Clinical Obstetrics, Washington University School of Medicine. Residence, 4947 Laclede Avenue; Office, Washington University Medical School, Scott and Euclid Avenues, St. Louis, Mo.

1901.—SCOTT, N. STONE, A.M., M.D., F.A.C.S. Formerly Dean and Professor of Surgery, College of Physicians and Surgeons, Cleveland; Consulting Surgeon to City Hospital; Consulting Surgeon to St. John's Hospital; Surgeon to the Out-patient Department of Cleveland General Hospital. Residence, 531 Prospect Avenue; Office, 603-605 Citizens' Building, Cleveland, Ohio.

1895.—SELLMAN, WILLIAM ALFRED BELT, M.D. Gynecologist to The Biedler and Sellman Sanitarium; Member of the Medical and Chirurgical Faculty of Maryland; also of the Baltimore City Medical Society; also of the American Medical Association; the Gynecological and Obstetrical Association of Baltimore; Physician to The Margaret J. Bennett Home for Young Ladies. *Vice-president,* 1908; *Executive Council,* 1909-1910. 5 East Biddle Street, Baltimore, Maryland.

1899.—SIMPSON, FRANK FARROW, A.B., M.D., F.A.C.S., Lieut. Col., M.C., U. S. Army. Chief Medical Section, Council of National Defense; Chief Section of Medical Industry. Gynecologist to the Allegheny General Hospital; Consulting Gynecologist to the Columbia Hospital. *Vice-president,* 1906. Jenkins Building, Pittsburgh, Pa.

1912.—SKEEL, ARTHUR JULIUS, M.D., F.A.C.S. Assistant Professor of Obstetrics, Western Reserve University; Obstetrician to St. Luke's Hospital; Consulting Obstetrician to the Florence Crittenden Home, Consulting Obstetrician to the Woman's Hospital. Residence and Office, 1834 East 65th Street, Cleveland, Ohio.

1901.—SKEEL, ROLAND EDWARD, M.D., F.A.C.S., M.S., A.M., Major M.C., U. S. Army, Hon. discharged. Formerly Associate Clinical Pro-

fessor of Gynecology in Western Reserve University; Formerly Gynecologist to St. Luke's, Cleveland, Ohio. Office, 302 Title Insurance Bldg., Los Angeles, Cal.

1910.—SMEAD, LEWIS FREDERIC, A.B., M.D., F.A.C.S. Surgeon to St. Vincent's Hospital, Toledo. Residence, 2921 Parkwood Avenue; Office, 227 Michigan Street, Toledo, Ohio.

1920.—SPEIDEL, EDWARD, M.D., Ph.G. Professor of Obstetrics, University of Louisville; Chief of Obstetrical Staff, Louisville City Hospital. Residence, The Besten; Office, Atherton Bldg., Louisville, Ky.

1902.—STARK, SIGMAR, M.D., F.A.C.S. Professor of Obstetrics and Clinical Gynecology in the Cincinnati College of Medicine and Surgery; Gynecologist to the Jewish Hospital. 1108 East McMillan Street, Cincinnati, Ohio.

1919.—STEIN, ARTHUR, M.D., F.A.C.S. Associate Gynecologist at Lenox Hill and Harlem Hospitals, New York City; Consulting Gynecologist, Hospital for Deformities. Residence and Office, 48 East Seventy-fourth Street, New York, N. Y.

1908.—STEWART, DOUGLAS HUNT, M.D., F.A.C.S. Adjunct Surgeon, O. P. D. Knickerbocker Hospital. Residence, 128 West 86th Street, New York, N. Y.

1899.—SWOPE, LORENZO W., M.D., F.A.C.S. Surgeon to the Consolidated Traction Company; Chief Surgeon to Wabash Railroad, Pittsburgh Division; Surgeon to Western Pennsylvania Hospital; Surgeon to Passavant Hospital; Member of the Allegheny County Medical Society; Member of the American Medical Association. Residence, 4629 Bayard Street; Office, 1105 Park Building, Pittsburgh, Pa.

1901.—TATE, MAGNUS ALFRED, M.D., F.A.C.S. Professor of Obstetrics Miami Medical College; President, Cincinnati Academy of Medicine. 1905; Obstetrician to the Cincinnati General Hospital and to the Good Samaritan Hospital. 19 West Seventh Street, Cincinnati, Ohio.

1920.—TITUS, PAUL, M.D. Obstetrician, Western Pennsylvania Hospital, St. Margaret Hospital, and City Tuberculosis Hospital, Pittsburgh; Professor of Obstetrics, School of Medicine, University of Pittsburgh. Residence, Adler Court Apts.; Office, 1015 Highland Bldg., Pittsburgh, Pa.

1908.—TORRENCE, GASTON, M.D. Surgeon to St. Vincent's and the Hillman Hospitals in Birmingham. Residence, 2705 Caldwell Avenue; Office, 325 Woodward Building, Birmingham, Ala.

1917.—TOVEY, DAVID WILLIAM, M.D. Adjunct Professor of Gynecology, N. Y. Polyclinic Medical School; Gynecologist N. Y. Polyclinic Hospital; Gynecologist Harlem Dispensary. Residence and Office, 240 Riverside Drive, New York, N. Y.

1919.—TRACY, STEPHEN E., M.D., F.A.C.S. Gynecologist, Stetson and Gynecean Hospitals; Consulting Gynecologist, Jewish Maternity Hospital. Residence, 615 Sixty-fifth Ave.; Office, 1527 Spruce Street, Philadelphia, Pennsylvania.

Founder.—VANDER VEER, ALBERT, A.M., M.D., PH.D., LL.D., F.A.C.S., Member Volunteer M.C. Five years Professor of Anatomy, Thirty-eight years Professor of Surgery, Albany Medical College; Surgeon-in-Chief, Albany Hospital; Consulting Surgeon, South End Dispensary; Consulting Surgeon, Benedictine Hospital, Kingston, N. Y.; Consulting Surgeon, Champlain Valley Hospital, Plattsburgh, N. Y.; Consulting Surgeon, Crippled and Ruptured Children, West Haverstraw, N. Y.; Fellow of the American Surgical Association (President, 1906); Fellow of the British Gynecological Society; Member of the American Medical Association (First Vice-president and President, 1915); Member of the Southern Surgical and Gynecological Association; Corresponding Member of the Boston Gynecological Society; Vice-Chancellor of the Board of Regents of the University of the State of New York. *Executive Council,* 1889-1891, 1895-1905; *President,* 1892. 28 Eagle Street, Albany, N. Y.

1913.—VANDER VEER, EDGAR ALBERT, PH.D., M.D., F.A.C.S. Attending Surgeon Albany Hospital; Consulting Surgeon, Champlain Valley Hospital, Plattsburgh, N. Y. Residence, 150 State St., Office, 28 Eagle St., Albany, N. Y.

1912.—VAN SWERINGEN, BUDD, M.D., Maj., M.R.C., U. S. Army. Gynecologist to the Lutheran Hospital, Surgeon to Pennsylvania Railroad; Formerly Professor of Medicine, Ft. Wayne College of Medicine. 208 Washington Boulevard, Fort Wayne, Indiana.

1909.—WADE, HENRY ALBERT, M.D., F.A.C.S. Visiting Surgeon to Bethany Deaconess's Hospital; Attending Gynecologist to Williamsburg Hospital, Brooklyn. 495 Greene Avenue, Brooklyn, N. Y.

1891.—WALKER, EDWIN, M.D., Ph.D., F.A.C.S. Surgeon to the Walker Hospital; Gynecologist to the Evansville City Hospital; President of the Indiana State Medical society, 1892; Member of the American Medical Association and of the Mississippi Valley Medical Association; Member of the Southern Surgical and Gynecological Association; First Vice-president American Medical Association, 1907. *Vice-president,* 1901. 712 South Fourth Street, Evansville, Ind.

1907.—WEISS, EDWARD ALOYSIUS, M.D., F.A.C.S., Lieut. Com., M.C., U. S. N. Gynecologist to Mercy Hospital; Gynecologist to Presbyterian Hospital; Obstetrician to Rosalia Maternity Hospital; Assistant Professor of Gynecology at University of Pittsburgh, Medical Department. 714 Jenkins Building, Pittsburgh, Pa.

1914.—WELTON, THURSTON SCOTT, M.D., F.A.C.S. Clinical Instructor of Gynecology and Obstetrics in the Long Island College Hospital; Associate Attending Gynecologist and Obstetrician to the Williamsburgh Hospital; Associate Visiting Gynecologist and Obstetrician to the Greenpoint Hospital; President Brooklyn Medical Society, 1917; Fellow, Brooklyn Gynecological Society. Residence and Office, 842 Union Street, Brooklyn, New York.

1904.—WEST, JAMES NEPHEW, M.D., F.A.C.S. Professor of Diseases of Women and Secretary of the Faculty at the New York Post-Graduate Medical School and Hospital. *Vice-president,* 1906. 71 West Forty-ninth Street, New York.

1921.—WETHERELL, FREDERICK STEPHEN, M.D. Associate Gynecologist, St. Joseph's Hospital; Instructor in Anatomy, Medical College of Syracuse University. Residence, 111 Durston Avenue; Office, 533 Butternut St., Syracuse, N. Y.

1911.—WHITE, GEORGE R., B.S., M.D., F.A.C.S. Surgeon Park View Sanitarium. 2 Liberty E., Savannah, Ga.

1916.—WING, LUCIUS ARTHUR, B.Sc., M.D., Capt., M.C., U. S. Army, Attending Surgeon, Lying-In Hospital, City of New York; Assisting Surgeon, St. Mary's Free Hospital for Children; Instructor in Clinical Surgery, Cornell University Medical College. Office and Residence, 53 East Sixty-fifth Street, New York, N. Y.

1909.—YATES, H. WELLINGTON, M.D., F.A.C.S. Gynecologist to Receiving Hospital; Gynecologist to Providence Hospital; Assistant Professor of Gynecology, Detroit College of Medicine and Surgery; Member of the Section on Obstetrics, Gynecology and Abdominal Surgery of the American Medical Association; Member of the Staff of St. Luke's Hospital; Member of the Wayne County and Michigan State Medical Society; President Detroit Medical Club; Medical Director of the Peninsular Life Insurance Co. Residence, 2475 Edison Street; Office, 1229 David Whitney Building, Detroit, Mich.

1907.—ZIEGLER, CHARLES EDWARD, A.M., M.D., F.A.C.S. Professor of Obstetrics in the University of Pittsburgh; Medical Director of the Elizabeth Steele Magee Hospital for Women; Medical Director of the Pittsburgh Maternity Dispensary; Consulting Obstetrician to the Columbia Hospital and Consulting Obstetrician and Gynecologist to the Dixmont Hospital for the Insane. 406 Morewood Ave., Pittsburgh, Pa.

1900.—ZINKE, ERNST GUSTAV, M.D., F.A.C.S., Professor of Obstetrics and Clinical Midwifery in the Ohio-Miami Medical College, University of Cincinnati, 1896-1916. Emeritus Professor of Obstetrics, 1916. Consulting Obstetrician to Cincinnati General Hospital. Honorary Chief of

Staff, and Obstetrician and Gynecologist to the Deaconess Hospital; President of the Cincinnati Obstetric Society, 1887; President, Academy of Medicine of Cincinnati, 1894; Member and Chairman of Section on Obstetrics, Gynecology, and Abdominal Surgery, American Medical Association, 1914; Member Southern Surgical Association; Honorary Member Jackson County Medical Society, Kansas City, Mo.; Honorary Member, Cincinnati Obstetric Society. *President*, 1908. *Executive Council*, 1909-1911. *Secretary*. 4 West Seventh St., Cincinnati, Ohio.

Total, one hundred and thirty-eight Ordinary Fellows.

ORDINARY FELLOWS DECEASED

1902.—ABRAMS, EDWARD THOMAS, A.M., M.D., F.A.C.S., Dollar Bay, Mich., 1918.

1890.—ASDALE, WILLIAM JAMES, M.D., Beaver Falls, Pa., 1912.

Founder.—BAKER, WASHINGTON HOPKINS, Philadelphia, Pa., 1904.

1913.—BLUME, FREDERICK, M.D., Pittsburgh, Pa., 1918.

1896.—BOSHER, LEWIS C., M.D., F.A.C.S., Richmond, Va., 1920.

1894.—BROWN, JOHN YOUNG, M.D., F.A.C.S., St. Louis, Mo., 1919.

1889.—BURNS, BERNARD, M.D., Allegheny, Pa., 1892.

Founder.—CARSTENS, J. HENRY, M.D., F.A.C.S., Detroit, Mich., 1920.

1890.—COLES, WALTER, M.D., St. Louis, Mo., 1892.

1889.—DAVIS, WILLIAM ELIAS B., M.D., Birmingham, Ala., 1903.

1892.—DORSETT, WALTER BLACKBURN, M.D., F.A.C.S., St. Louis, Mo., 1915.

1892.—DUFF, JOHN MILTON, A.M., M.D., PH.D., Pittsburgh, Pa., 1904.

1898.—DUNN, JAMES C., M.D., Pittsburgh, Pa., 1907.

1892.—DUNNING, LEHMAN HERBERT, M.D., Indianapolis, Ind., 1906.

1899.—EASTMANN, THOMAS BARKER, A.B., M.D., F.A.C.S., Indianapolis, Ind., 1919.

1895.—FERGUSON, ALEXANDER HUGH, M.D., Chicago, Ill., 1911.

1890.—FREDERICK, CARLTON CASSIUS, B.S., M.D., Buffalo, N. Y., 1911.

1913.—FREELAND, JAMES ROY, M.D., F.A.C.S., Pittsburgh, Pa., 1917.

1891.—GIBBONS, HENRY, JR., A.M., M.D., San Francisco, Cal., 1912.

1904.—GOODFELLOW, GEORGE E., M.D., Los Angeles, Cal., 1910.

1913.—GRAY, FRANK D., M.E.D., M.D., F.A.C.S., Jersey City, N. J., 1916.

1892.—HAGGARD, WILLIAM DAVID, SR., M.D., Nashville, Tenn., 1901.

Founder.—HILL, HAMPTON EUGENE, M.D., Saco, Me., 1894.

1912.—HOTALING, ALBERT STEUBEN, M.D., Syracuse, N. Y., 1913.

1898.—HYDE, JOEL W., M.D., Brooklyn, N. Y., 1907.

1897.—INGRAHAM, HENRY DOWNER, M.D., Buffalo, N. Y., 1904.

1909.—JACOBSON, JULIUS H., M.D., F.A.C.S., Toledo, O., 1919.

Founder.—JARVIS, GEORGE CYPRIAN, M.D., Hartford, Conn., 1900.

1892.—JELKS, JAMES THOMAS, M.D., Hot Springs, Ark., 1902.

1910.—JENKS, NATHAN, B.S., M.D., F.A.C.S., Detroit, 1916.

Founder.—LOTHROP, THOMAS, M.D., Buffalo, N. Y., 1902.

1900.—LINVILLE, MONTGOMERY, A.B., M.D., New Castle, Pa., 1910.

1890.—LONGYEAR, HOWARD WILLIAMS, M.D., F.A.C.S., Detroit, Mich., 1921.

1896.—LYONS, JOHN A., M.D., Chicago, Ill., 1919.

1891.—MCCANN, JAMES, M.D., Pittsburgh, Pa., 1893.

1898.—MCCANN, THOMAS, M.D., Pittsburgh, Pa., 1903.

1911.—MARVEL, EMERY, M.D., F.A.C.S., Atlantic City, N. J., 1920.

1896.—MOONEY, FLETCHER D., M.D., St. Louis, Mo., 1897.

1894.—MURPHY, JOHN BENJAMIN, A.M., M.D., F.A.C.S., Chicago, Ill., 1916.

Founder.—POTTER, WILLIAM WARREN, M.D., Buffalo, N. Y., 1911.

Founder.—PRICE, JOSEPH, M.D., Philadelphia, Pa., 1911.

1896.—RHETT, ROBERT BARNWALL, JR., M.D., Charleston, S. C., 1901.

1889.—ROHE, GEORGE HENRY, M.D., Baltimore, Md., 1899.

1892.—ROSENWASSER, MARCUS, M.D., Cleveland, O., 1910.

1890.—ROSS, JAMES FREDERICK WM., M.D., C.M., L.R.C.P., Toronto, Ontario, Canada, 1911.

1889.—SEYMOUR, WILLIAM WOTKYNS, A.B., M.D., Troy, N. Y., 1904.

1902.—SIMONS, MANNING, M.D., Charleston, S. C., 1911.

1913.—SMITH, LEWIS W., A.B., M.D., Pittsburgh, Pa., 1917.

1913.—STAMM, MARTIN, M.D., F.A.C.S., Fremont, O., 1918.

1911.—STILLWAGEN, CHARLES A., Pittsburgh, Pa., 1921.

1914.—STRASSER, AUGUST ADRIAN, M.D., F.A.C.S., Arlington, N. J., 1918.

Founder.—TOWNSEND, FRANKLIN, A.M., M.D., Albany, N. Y., 1895.

1907.—VANCE, AP MORGAN, M.D., F.A.C.S., Louisville, Ky., 1915.

Founder.—WERDER, XAVIER OSWALD, M.D., F.A.C.S., Pittsburgh, Pa., 1919.

Total: Fifty-four.

ORDINARY FELLOWS

Classified

ALABAMA

Davis, John D. S.,	2031 Avenue G.,	Birmingham.
Torrance, Gaston,	325 Woodward Bldg.,	Birmingham.

ARKANSAS

Runyan, Joseph Phineas,	State Bank Bldg.,	Little Rock.

CALIFORNIA

Skeel, R. E.,	402 Title Insurance Bldg.,	Los Angeles.
Buteau, Samuel H.,	1155 Broadway,	Oakland.
Hadden, David,	Oakland Bank of Savings Bldg.	Oakland.
Percy, James F.,	2541 First St.,	San Diego.

CANADA

Olmsted, Ingersoll,	215 South James St.,	Hamilton, Ontario.

DISTRICT OF COLUMBIA

Garnett, A. Y. P.,	1824 Massachusetts Ave.,	Washington.
Moran, J. F.,	2420 Pennsylvania Ave., N.W.,	Washington.

GEORGIA

Noble, George Henry,	186 South Pryor Street,	Atlanta.
White, George R.,	2 Liberty E.,	Savannah.

ILLINOIS

Barrett, Channing,	4245 N. Ashland Ave.,	Chicago.
Goldspohn, Albert,	34 Washington St.,	Chicago.
Schmitz, Henry,	25 E. Washington St.,	Chicago.
Bacon, Joseph B.,		Macomb.
Montgomery, Edward B.,	134 North 8th St.,	Quincy.

INDIANA

Walker, Edwin,	712 South Fourth St.,	Evansville.
Porter, Miles F.,	207 West Wayne St.,	Fort Wayne.
Rosenthal, M. I.,	336 West Berry St.,	Fort Wayne.
Van Sweringen, Budd,	208 Washington Blvd.,	Fort Wayne.
Burckhardt, Louis,	621 Hume-Mansur Bldg.,	Indianapolis.
Clark, Edmund, D.,	712 Hume-Mansur Bldg.,	Indianapolis.
Mendenhall, A. M.,	333 Newton-Claypool Bldg.,	Indianapolis.
Noble, Thomas B.,	720 Newton-Claypool Bldg.,	Indianapolis.
Pantzer, Hugo O.,	224 North Meridian St.,	Indianapolis.
Pfaff, O. G.	1337 North Pennsylvania St.,	Indianapolis.
Sutcliff, John A.,	1121 Central Ave.,	Indianapolis.

IOWA

Ruth, Charles E.,	Iowa Bldg.,	Des Moines.

KENTUCKY

Frank, Louis,	The Atherton,	Louisville.
Speidel, Edward,	The Atherton,	Louisville.

MAINE

Leighton, Adam P.,	192 State St.,	Portland.

MARYLAND

Branham, Joseph H.,	2200 Eutaw Place,	Baltimore.
Sellman, William A. B.,	5 East Biddle St.,	Baltimore.

MICHIGAN

Bell, John Norval,	506 Washington Arcade,	Detroit.
Brown, Geo. Van Amber,	32 Adams Ave., West,	Detroit.
Davis, James E.,	111 Josephine Ave.,	Detroit.
Hewitt, H. W.,	1131 David Whitney Bldg.,	Detroit.
Manton, Walter P.,	32 Adams Avenue, West	Detroit
Yates, H. Wellington,	1360 Fort Street,	Detroit.

MINNESOTA

Condit, William H.,	900 Donaldson Bldg.,	Minneapolis.
Litzenberg, Jennings C.,	Donaldson Bldg.,	Minneapolis.
Farr, Robert E.,	301 Physicians & Surgeons Bldg.	Minneapolis.

MISSOURI

Mosher, G. C.,	605 Bryant Bldg.,	Kansas City.
Crossen, H. S.,	Metropolitan Bldg.,	Saint Louis.
Dorsett, E. Lee,	University Club Bldg.,	Saint Louis.
Elbrecht, Oscar H.,	Metropolitan Bldg.,	Saint Louis.
Jonas, Ernst,	465 North Taylor Ave.,	Saint Louis.
Kirchner, Walter C. G.,	508 Metropolitan Bldg.,	Saint Louis.
Reder, Francis,	415 University Club Bldg.,	Saint Louis.
Royston, G. D.,	Wall Bldg.,	Saint Louis.
Schwarz, Henry,	440 North Newstead Ave.,	Saint Louis.
Schwarz, O. H.,	820 University Club Bldg.,	Saint Louis.

NEBRASKA

Findley, Palmer,	418 Brandeis Theater Bldg.,	Omaha.

NEW JERSEY

Darnall, Wm. Edgar,	1704 Pacific Ave.,	Atlantic City.
Dickinson, Gordon K.,	280 Montgomery St.,	Jersey City.
Ill, Charles L.,	188 Clinton Ave.,	Newark.
Ill, Edward J.,	1002 Broad St.,	Newark.
Hedges, Ellis W.,	703 Watchung Ave.,	Plainfield.

NEW YORK

Boyd, James P.,	152 Washington Ave.,	Albany.
Harper, Paul T.,	289 State Street,	Albany.
Vander Veer, Albert,	28 Eagle Street,	Albany.
Vander Veer, Edgar A.,	150 State St.,	Albany.
Pfeiffer, William,	368 McDonough St.,	Brooklyn.
Polak, John O.,	287 Clinton Ave.,	Brooklyn.
Wade, Henry A.,	495 Greene Ave.,	Brooklyn.
Welton. T. Scott,	842 Union St.,	Brooklyn.
Hayd, H. E.,	493 Delaware Ave.,	Buffalo.
King, James E.,	1248 Main St.,	Buffalo.
Lothrop, Earl P.,	153 Delaware Ave.,	Buffalo.
Potter, Irving W.,	420 Franklin St.,	Buffalo.
Chandler, George,	11 East Chestnut St.,	Kingston.
Peck, George A.,	189 Centre Ave.,	New Rochelle.
Bainbridge, W. S.,	34 Gramercy Park,	New York.
Bandler, S. W.,	134 West Eighty-seventh St.,	New York.
Davis, Asa B.,	42 East 35th St.,	New York.
Erdmann, John F.,	60 West Fifty-second St.,	New York.
Furniss, Harry Dawson,	54 East 48th St.,	New York.
Harrar, James A.,	100 East 66th St.,	New York.
Hill, I. L.,	616 Madison Ave.,	New York.
Kosmak, G. W.,	23 East 93rd St.,	New York.
Lynch, Jerome Morley,	57 East 52nd St.,	New York.
McPherson, Ross A.,	45 West 62nd St.,	New York.
Meeker, Harold D.,	420 West End Ave.,	New York.
Morris, R. T.,	616 Madison Ave.,	New York.
Rongy. Abraham J.,	345 West 88th St.,	New York.
Stein, Arthur,	48 East 74th St.,	New York.
Stewart. Douglas H.,	128 West 86th St.,	New York.
Tovey, David W.,	240 Riverside Drive,	New York.
West, James N.,	71 West Forty-ninth St.,	New York.
Wing, Lucius A..	53 East 65th St.,	New York.
Sadlier, James E.,	295 Mill St.,	Poughkeepsie.
Poucher, John W.	339 Mill St.,	Poughkeepsie.
Brown, Wm. M.,	1776 East Ave.,	Rochester.
Quigley, J. K..	303 Alexander St.,	Rochester.
Moriarta, Douglas C.,	511 Broadway,	Saratoga Springs.
Miller, A. B..	326 Montgomery St.,	Syracuse.
Wetherell. Frederick S.,	553 Butternut St.,	Syracuse.

OHIO

Bonifield, Chas. L.,	409 Broadway,	Cincinnati.
Hall, Joseph A.,	628 Elm St.,	Cincinnati.
Hall, Rufus B.,	628 Elm St.,	Cincinnati.
Miller, John D.,	N. E. Cor. Clifton & McMillan	Cincinnati.
Porter, W. D.,	Melrose Bldg.,	Cincinnati.
Reed, C. A. L.,	The Groton,	Cincinnati.
Stark, Sigmar,	1108 East McMillan St.,	Cincinnati.
Tate, Magnus A.,	19 West Seventh St.,	Cincinnati.
Zinke, E. G.,	4 West 7th St.,	Cincinnati.
Bill, A. H.,	Osborn Bldg.,	Cleveland.
Crile, George W.,	Cleveland Clinic, Euclid at E. 93rd St.,	Cleveland.
Scott, N. Stone,	603 Citizens Bldg.,	Cleveland.
Skeel, Arthur,	1834 East 65th St.,	Cleveland.
Baldwin, James F.,	405 East Town St.,	Columbus.
Crotti. André,	151 East Broad St.,	Columbus.
Goodman, S. J.,	121 South 6th St.,	Columbus.
Hamilton, Chas. S.,	142 South Garfield St.,	Columbus.
Dice, Wm. Gordon.	240 Michigan St.,	Toledo.
Douglass, Fred M.,	421 Michigan St.,	Toledo.
Gillette, Wm. J.,	1613 Jefferson St.,	Toledo.
Moots, Chas. W.,	225 Michigan St.,	Toledo.
Smead, Lewis F.,	227 Michigan St.,	Toledo.
McClellan, Benjamin R.,	7 East Second St.,	Xenia.

PENNSYLVANIA

Babcock, W. Wayne,	2033 Walnut St.,	Philadelphia.
Kennedy, James W.,	1409 Spruce St.,	Philadelphia.
Tracy, S. E.,	1527 Spruce St.,	Philadelphia.
Foster, Curtis S.,	308 Diamond Bank Bldg.,	Pittsburgh.
Huggins, R. R.,	1018 Westinghouse Bldg.,	Pittsburgh.
Langfitt, William S.,	Jenkins Bldg.,	Pittsburgh.
Sanes, K. I.,	Jenkins Bldg.,	Pittsburgh.
Schildecker, Charles B.,	1105 Park Bldg.,	Pittsburgh.
Simpson, Frank F.,	Jenkins Bldg.,	Pittsburgh.
Swope, Lorenzo W.,	1105 Park Bldg.,	Pittsburgh.
Titus, Paul,	1015 Highland Bldg.,	Pittsburgh.
Weiss, Edward A.,	714 Jenkins Bldg.,	Pittsburgh.
Ziegler, Chas. E.,	406 Morewood Ave.,	Pittsburgh.

RHODE ISLAND

Jones, Arthur T.,	81 Elm Grove Ave.,	Providence.
Keefe, John W.,	259 Benefit St.,	Providence.

TENNESSEE

Haggard, William D.,	148 Eighth Ave., North,	Nashville.

VIRGINIA

Lankford, Burnley,	246 West Freemason St.,	Norfolk.
Baughman, Greer,	26 North Laurel St.,	Richmond.
Rucker, M. Pierce.	400 N. Lombardy St.,	Richmond.

MINUTES OF THE PROCEEDINGS

OF THE

THIRTY-FOURTH ANNUAL MEETING

OF THE

AMERICAN ASSOCIATION

OF

OBSTETRICIANS, GYNECOLOGISTS,

AND

ABDOMINAL SURGEONS

HELD AT

THE STATLER HOTEL

ST. LOUIS, MISSOURI

SEPTEMBER 20, 21 AND 22, 1921.

THIRTY-FOURTH ANNUAL MEETING

SEPTEMBER 20, 21, AND 22, 1921

The Fellows whose names appear below were present:

BAINBRIDGE, WM. SEAMAN	NEW YORK CITY.
BELL, JOHN N.	DETROIT.
BILL, ARTHUR H.	CLEVELAND.
BONIFIELD, CHARLES L.	CINCINNATI.
BROWN, G. VAN AMBER	DETROIT.
CHANDLER, GEORGE F.	KINGSTON, N. Y.
CONDIT, WILLIAM H.	MINNEAPOLIS.
DARNALL, WM. EDGAR	ATLANTIC CITY.
DAVIS, JAMES E.	DETROIT.
DICE, W. G.	TOLEDO.
DICKINSON, GORDON K.	JERSEY CITY.
DORSETT, E. LEE	ST. LOUIS.
DOUGLASS, FRED. M.	TOLEDO.
ELBRECHT, OSCAR H.	ST. LOUIS.
FARR, ROBERT EMMETT	MINNEAPOLIS.
FINDLEY, PALMER	OMAHA, NEB.
HALL, RUFUS B.	CINCINNATI.
HAYD, HERMAN E.	BUFFALO.
HUGGINS, RALEIGH R.	PITTSBURGH.
JONAS, ERNST	ST. LOUIS.
JONES, ARTHUR T.	PROVIDENCE.
KEEFE, JOHN W.	PROVIDENCE.
KING, JAMES E.	BUFFALO.
KIRCHNER, WALTER C. G.	ST. LOUIS.
McCLELLAN, BENJAMIN R.	XENIA, O.
MENDENHALL, A. M.	INDIANAPOLIS.
MILLER, AARON B.	SYRACUSE.
MILLER, JOHN D.	CINCINNATI.
MONTGOMERY, E. B.	QUINCY, ILL.
MOOTS, CHARLES W.	TOLEDO.
MORAN, JOHN F.	WASHINGTON.
MOSHER, GEORGE CLARK	KANSAS CITY.
NOBLE, THOMAS B.	INDIANAPOLIS.
PANTZER, HUGO O.	INDIANAPOLIS.
PFAFF, ORANGE G.	INDIANAPOLIS.
POLAK, JOHN OSBORN	BROOKLYN.

PORTER, MILES F. ..... FORT WAYNE.
POTTER, IRVING W. ..... BUFFALO.
POUCHER, JOHN W. ..... POUGHKEEPSIE.
REDER, FRANCIS ..... ST. LOUIS.
RONGY, ABRAHAM J. ..... NEW YORK CITY.
ROYSTON, GRADISON D. ..... ST. LOUIS.
RUCKER, M. PIERCE ..... RICHMOND.
RUNYAN, JOSEPH P. ..... LITTLE ROCK.
RUTH, CHARLES E. ..... DES MOINES.
SADLIER, JAMES E. ..... POUGHKEEPSIE.
SANES, K. ISADORE ..... PITTSBURGH.
SCHWARZ, HENRY ..... ST. LOUIS.
SCHWARZ, OTTO H. ..... ST. LOUIS.
SKEEL, ROLAND E. ..... LOS ANGELES.
SMEAD, LEWIS F. ..... TOLEDO.
SPEIDEL, EDWARD ..... LOUISVILLE.
TATE, MAGNUS A. ..... CINCINNATI.
TRACY, STEPHEN E. ..... PHILADELPHIA.
VANDER VEER, EDGAR A. ..... ALBANY.
VAN SWERINGEN, BUDD ..... FORT WAYNE.
WEISS, EDWARD A. ..... PITTSBURGH.
WETHERELL, FREDERICK S. ..... SYRACUSE.
ZINKE, E. GUSTAV ..... CINCINNATI.
Total, 59.

The following-named registered guests were extended the privileges of the floor and invited to participate in the discussions:

Ayars, Treston R. ..... St. Louis.
Ayres, O. A. ..... Leighton, Ia.
Borck, Henrietta A. S. ..... St. Louis.
Burdick, Jesse J. ..... St. Louis.
Christensen, Grover E. ..... Salt Lake City.
Clapper, W. L. ..... St. Louis.
Costen, James B. ..... St. Louis.
Ehrenfest, Hugo ..... St. Louis.
Esserman, A. L. ..... St. Louis.
Gellhorn, George ..... St. Louis.
Griffin, Patrick H. ..... St. Louis.
Hargis, W. H. ..... San Antonio.
Hinchey, Frank ..... St. Louis.
Hyndman, Chas. E. ..... St. Louis.
Ingraham, Fred D. ..... Toledo.
Joslad, O. ..... St. Louis.

Keefe, Chas. P. D. ..... St. Louis.
Kennedy, P. H. ..... St. Louis.
Kerwin, William ..... St. Louis.
Kirby, Henry H. ..... Little Rock.
Krebs, O. S. ..... St. Louis.
Kuble, Chas. B. ..... St. Louis.
McKinney, G. L. ..... Alton, Ill.
McNalley, F. P. ..... St. Louis.
Michael, Wm. A. ..... St. Louis.
Miller, W. Porter ..... Syracuse.
Morgner, Omar. ..... St. Charles, Mo.
Neely, Jr., Wm. K. ..... Philadelphia.
Neill, W. C. ..... Toledo.
Newton, S. N. ..... Stover, Mo.
Niebruegge, H. J. ..... St. Louis.
O'Brien, Minnie C. ..... San Antonio.
O'Keefe, Chas. D. ..... St. Louis.
Oldham, S. P. ..... Owensboro, Ky.
Ottofy, L. M. ..... St. Louis.
Paddock, Richard ..... St. Louis.
Parks, S. M. ..... Glathe, Tex.
Pearson, N. T. ..... Louisiana.
Pfeiffenberger, Mather ..... Alton, Ill.
Pride, W. T. ..... Memphis, Tenn.
Schlossstein, A. E. ..... St. Louis.
Schmitz, Edgar F. ..... St. Louis.
Scholer, H. C. ..... Kansas City.
Shankland, J. W. ..... St. Louis.
Smith, G. D. ..... St. Louis.
Spivy, Raymond M. ..... St. Louis.
Storrs, Henry J. ..... St. Louis.
Strouquit, E. A. ..... St. Louis.
Swahlen, Percy H. ..... St. Louis.
Taussig, Fred. J. ..... St. Louis.
Tilles, Randall S. ..... St. Louis.
Topmoeller, Geo. B. ..... Cincinnati.
Traubitz, Arnold ..... Vanduser, Mo.
Tuholske, Lister H. ..... St. Louis.
Urban, E. T. ..... St. Louis.
Van Hoosen, Bertha ..... Chicago.
Vaughan, John R. ..... St. Louis.
Vogt, Wm. H. ..... St. Louis.
Well, Wm. ..... Versailles, Mo.
Wells, Louis ..... Rich Fountain, Mo.

Williams, J. J. ..... St. Louis.
Wilson, S. S. ..... Nebraska City.
Wobus, E. R. ..... St. Louis.
Woolsey, Ray A. ..... St. Louis.
Total, 64.

FIRST DAY.—*Tuesday, September* 20, 1921

Morning Session.—The thirty-fourth annual meeting was called to order at the Hotel Statler, St. Louis, at 9:30 A.M., by the President, Dr. Henry Schwarz, St. Louis, who said:

Fellows of the American Association of Obstetricians, Gynecologists, and Abdominal Surgeons: The hour has arrived when it becomes my duty to declare the thirty-fourth annual meeting of this Association now formally opened. We are honored this morning by the presence of the City's chief executive officer, and I call upon the Chairman of the Committee of Arrangements to introduce His Honor, the Mayor of St. Louis. (Applause.)

DR. REDER.—Mr. President and Fellows of the Association, Ladies and Gentlemen: Cordial and sincere as is the greeting of the local Fellows, we felt that perhaps a word of welcome from our gracious Mayor would make you feel just a little bit more at home in the City.

I take great pleasure in introducing to you the Hon. Henry Kiel, Mayor of St. Louis, who will give us greeting. (Prolonged applause.)

ADDRESS OF WELCOME BY MAYOR KIEL

MR. PRESIDENT, Dr. Reder, Ladies and Gentlemen: You know I feel particularly honored this morning at having the privilege of addressing and extending a few words of greeting to so distinguished an audience as this is. When I come in contact with men who have devoted their lives unselfishly to the kind of work you are devoted to, I feel that my time is not wasted; that I am speaking to men who have done much for the welfare of the people of the world, and a great many—practically all of you—unselfishly. A young man when he embarks into the real drift of life naturally chooses some sort of vocation, and the man who chooses your vocation, who strives to become a Doctor of Medicine, a surgeon, has not the easiest kind of work to begin with. I see many a young man who strives and struggles in order to get an education so as to be able to dedicate himself to such work, and it takes years of study and hardship and endurance before he gets to the place where it begins to pay him something. For that reason you have men who at great sacrifice, made unselfishly, can now help those who need help. If it were not for the medical men, for the surgeons, there would be a great many more hardships

than there are at present. I realize this every day in the City of St. Louis. If it were not for the men like you there would be untold suffering among the poorer classes. One thing I must say for the visiting staffs of our St. Louis Eleemosynary institutions—I do not know how it is elsewhere, but we have a wonderful lot of men who are giving of their time and their attention and even of their money, so that these institutions may be supported and maintained. I hope you will see every one of our eleemosynary institutions so that you may know what we are doing to promote the best interests of our citizens. In every large city there is much suffering. In our City Hospital we have eight or nine hundred beds always filled and if it were not for men like you these poor creatures would simply die and pass away, but you men come and give your services freely, and the result is that we have an institution we can boast of because of the unselfishness of our physicians.

I am glad to come here and welcome you. You who are strangers will realize that we have a wonderful city in St. Louis. We have a splendid lot of citizens; we have learned to play together and work together, to be happy together and to do things that make for contentment. We have learned to realize that every man has a right to his opinion and every one is entitled to consideration.

You are here at a period of the year that is most pleasant. The climatic conditions are excellent during the autumn. Sometimes in summer we have some hot weather, and in the winter we have some cold weather; but at this period of the year it is ideal. We have the glorious sunshine that is free to all of us; in the country the foliage is just beginning to turn upon the trees. Around the country you will find many artistic points and I know you are not going to spend all of your time in work, but that you will devote some portion of it to enjoying yourselves. I know your Entertainment Committee has provided well for your entertainment. If not, just complain to me and it will be a terrible time for your Chairman after you leave (laughter).

While you are here accepting our hospitality, we want you to remember that you are with home folks. We want to impress upon you that we like you, that we are glad you chose St. Louis as your meeting place. We want you to know and see all the beautiful things that we have. I will not attempt to enumerate them, for if I did I would not get through until noontime. You have an extended program, but after you are through exchanging your thoughts and your ideas and taking part in your discussions, I know you will go away with more knowledge than you had when you came. That is the purpose of these gatherings. If more people would get together and exchange their ideas and explain themselves, more disputes could be

settled amicably. No matter how much a man knows, or how little he knows, he can always learn more from a frank discussion such as you have here. If Capital and Labor would only sit down in a meeting place and discuss things frankly and openly they could relieve many of the conditions which now exist.

This is a period of reconstruction, of building over. During the war we learned to live extravagantly and went along in a sort of haphazard way gratifying every desire, for everything came so easy, but now we have come to the point where we have to retrench and go out and get it, and by these meetings we can help to solve these problems. By the time you leave you will have accomplished something.

I want again, in conclusion, to impress upon you that we are glad you came. We want you to know all of our good doctors and surgeons, and we have lots of them. We have many hospitals that are second to none in the United States. We have a great many contemplated hospitals, among them the Shrine Hospital for Crippled Children and the Missouri Hospital, a building which is to cost one and a half millions. We are learning that it pays to put our money in that kind of investment and the result is that St. Louis is becoming a leader in that kind of work. I hope you will visit these institutions before you leave. I want to impress upon you the really idealistic things we have been trying to create in our government, and I hope you will go to see the City Hospital and the Tuberculosis Hospital and the Eye and Ear Hospital, and then if you have an hour or an hour and a half go up to Ft. Bellefontaine Farm, a penal institution for the young and see what a wonderful place that is. It is one of the greatest in the world, where we take the little fellows who happen to slip in their youth and the Judge settles them for three or four years at Bellefontaine, and there we pick them up and give them real training so that they develop into good manhood. If you can put in an hour and a half and see that farm of 360 acres on the beautiful site overlooking the Missouri River, and see the dairy with its fine herd of Holsteins, none better anywhere, and see the instruction the youngsters receive—they have school in the morning and in the afternoon they get out and cultivate the soil—I am sure you will feel well repaid.

See what we are doing in St. Louis and I think you will go away convinced that while we may not be the largest city, we are one of the best, and we are glad to have you here. When you go back to your homes, if you will think of us kindly and sing our praises, if you can, we will be everlastingly grateful to you. I thank you. (Prolonged applause.)

THE PRESIDENT.—I will ask our First Vice-President, Dr. Benjamin R. McClellan, to respond to this address of welcome.

RESPONSE TO MAYOR'S ADDRESS OF WELCOME

DR. BENJAMIN R. MCCLELLAN.—Mr. President, Honorable Mayor, Fellows of the Association and Friends: It is most gratifying and inspiring to be present at this thirty-fourth annual meeting of the Association with such warm words of welcome from the Chief Executive of this central city of the United States of America. We are in Missouri. This in itself should make us feel at home, since the spirit of this Association has always been one of skepticism. Who can ever forget the doubters when Potter gave us his first report of podalic version, when most of those present cried out "You'll have to show me!"? (Laughter.)

To me St. Louis is an inspiration because it is the home of so many of the leaders and teachers in obstetrics and gynecology. This is the thirty-fourth meeting; at the seventeenth we met in this city and at that time the senior Dorsett—gone hence now—was your president. Today, the thirty-fourth meeting, another seventeen years intervening, our splendid Dr. Schwarz is our leader. The happy thing to me is to think of these two men in the heyday of their great success in their profession, hand in hand, hopefully and happily going along in their chosen work, and now today each of them with a son going along holding high the great ideals their fathers have held before them. Today it is one of the most charming things I have had in meeting with the members of the profession in this Association. (Applause.)

After listening to this splendid address of welcome it is not difficult for us to understand why St. Louis has honored itself by twice electing Henry Kiel to the place of highest preferment in the gift of the people. After all, it is the spirit of doing things worth while that counts. What a monument of praise to be said of any man that he so lived and labored for the citizens that by his energy there was builded a great public highway like the new bridge that spans the river, and that the same hand and brain gave to the citizens a great hospital where rich and poor alike are cared for. The same broad vision recognized a field for good by organizing the Junior Chamber of Commerce. I have learned this morning of the great interest this man takes in the children of the city in providing public playgrounds and providing for the physical welfare of the lads and lassies of St. Louis. What a splendid thing it is to have a man who does things worth while!

Your Honor, this body of men and women, earnest in their effort to do things for the people, do most sincerely thank you for your presence and for your warm words of welcome. (Applause.)

THE PRESIDENT.—The Chair now calls on Dr. Lee Dorsett, also a member of the Committee on Arrangements, to introduce the President of the St. Louis Medical Society who was supposed to be here today to say a word of welcome on behalf of the medical profession of St. Louis.

DR. LEE DORSETT.—Mr. President, Fellows of the Association: It was impossible for Dr. North to be here at this time, but I take great pleasure in introducing Dr. Charles E. Hyndman, Vice-President of the St. Louis Medical Society. (Applause.)

DR. HYNDMAN.—Mr. President, Gentlemen of the Association, Ladies and Gentlemen: I welcome you all. I will try to express to you our feeling of welcome on behalf of the St. Louis Medical Society. I am not a gynecologist or obstetrician, I merely do a little "belly surgery" as we call it. I would feel a little embarrassed at coming to this meeting except that it is in keeping with my usual experience in life and practice. I have never taken an obstetrical case in my life, but I have taken care of many a case for other men. People frequently call me up and ask me to take care of them. I tell them I do not do that kind of work, but they insist and say, "My own Doctor is out of town, won't you please come?" So I am here this morning. (Laughter.)

There is little to say after the Mayor has invited you to take all there is, but I do wish to say that the profession here has a great interest in your Society and in you as individuals, and we want you to make yourselves perfectly at home and we want you to call on any of the profession for anything you want. His Honor, the Mayor, has offered you everything there is—the flowers, the beautiful country, the building, the streets, the parks, and has even invited you to partake of the beautiful sunshine. Now, on behalf of the medical profession I wish to say that there will be free moonshine all over the city tonight! (Laughter and applause.)

THE PRESIDENT.—I will call on Dr. King to make a short address in response to Dr. Hyndman.

RESPONSE TO ADDRESS OF WELCOME BY DR. KING

Mr. President, Dr. Hyndman, Fellows: I wish to ask Dr. Hyndman to convey to the members of the Medical Society of the City of St. Louis our grateful thanks for your very splendid welcome you have just extended us. For those of us who are familiar with the hospitality of the middle west, and of St. Louis in particular, these two addresses of welcome this morning only accentuate what our experience has taught us, while those who have never been so fortunate as

to be in St. Louis as guests will find that these remarks made this morning will be carried out to the absolute letter. I am sure that from the remarks of the last speaker the eighteenth amendment has made no difference in the usual cordial welcome that strangers receive in this world-renowned city. We feel, too, that the meeting in St. Louis is particularly fitting because you have in this city a large and well-manned University, and St. Louis is year by year becoming more prominent in the medical circles, not only of the United States but, I believe also, in the world.

Therefore, we accept your cordial welcome and your invitation to enjoy your city, and we also extend to you an invitation to be present at our deliberations and to participate in the discussions. Dr. Hyndman, we thank you. (Applause.)

THE PRESIDENT.—It is now exactly 10:00 o'clock, the time set for our Scientific Papers, so I will call upon Dr. Bell.

Papers were then presented as follows:

1. "Diabetes and pregnancy," by Dr. John N. Bell, Detroit, Mich.

This paper was discussed by Drs. Irving W. Potter, Buffalo, N. Y.; M. A. Tate, Cincinnati, Ohio, and the discussion closed by Dr. Bell.

2. "Heart disease in pregnancy," by Dr. William G. Dice, Toledo, Ohio.

Discussed by Dr. John Osborn Polak, Brooklyn, N. Y., and the discussion closed by Dr. Dice.

3. "Bleeding nipple," by Gordon K. Dickinson, Jersey City, N. J.

This paper was discussed by Drs. James E. Davis, Detroit, Michigan; Roland E. Skeel, Los Angeles, Cal.; Aaron B. Miller, Syracuse, N. Y.; Charles W. Moots, Toledo, Ohio; William S. Bainbridge, New York City; and, in closing, by the essayist.

SYMPOSIUM ON ABORTION

4. "The slaughter of the innocents," by Dr. Palmer Findley, Omaha, Nebraska.

5. "The legal aspect of abortion," by Mr. Ernest F. Oakley, Jr., Prosecuting Attorney of St. Louis. (By invitation.)

6. "The therapeutic aspect of abortion," by Dr. H. Wellington Yates, Detroit, Michigan. (In the absence of the author this paper was presented by Dr. George VanAmber Brown, Detroit.)

DR. BROWN.—I never feel comfortable in appearing in public, but, I am sure, in this instance I feel more comfortable following the Prosecuting Attorney than if he were tagging me. (Laughter.)

Dr. Yates I am sure is missed by all of you and he asked me to convey to you his regrets at not being present.

The discussion of this symposium was opened by Dr. George C. Mosher, Kansas City, Mo., and continued by Drs. Weiss, Rucker, Dickinson, Ehrenfest, and then closed by Mr. Oakley.

On motion, the Association took a recess until 2:30 P.M.

Afternoon Session.—The Association reconvened at 2:45 P.M., and was called to order by First Vice-President, Dr. Benjamin R. McClellan.

7. "Additions to our obstetric armamentarium," by Dr. Charles Edward Ziegler, Pittsburg, Pa.

This paper was discussed by Drs. E. A. Weiss, John O. Polak, George C. Mosher, and the discussion closed by the essayist.

8. "Can we provide better maternity care by legislative enactments?" by Dr. George W. Kosmak, New York City. (The Chairman announced that Dr. Kosmak was unable to be present, but had sent a brief outline of his paper, which would be read by the Secretary. Following the reading the Chair asked what should be done with the communication.)

DR. HENRY SCHWARZ.—I move that it be laid on the table.

DR. HERMAN E. HAYD.—I would like to have Dr. Schwarz tell us why it should be laid on the table.

DR. SCHWARZ.—I am against the matter being brought up at this time, during the scientific program. Personally, I have always considered the Sheppard-Towner Bill one of the best things that has ever been brought up. I am sorry that many of the states, Missouri included are not ready to come in and profit by the bill. The bill does not provide for maternity care by Uncle Sam, but only those states that have already set aside certain sums or requirements, and it gives them financial support. It sends men and women who are trained for the work into a state for propaganda, simply to get back of the community or communities away from medical centers who give no care to expectant mothers and show them how it should be done, in the hope that they will do it of their own accord, and not by Uncle Sam. Uncle Sam only acts as an adviser in these cases, and for these reasons I do not wish this to go on record at this late hour as protesting a thing which is of immense benefit to the entire country. I think these resolutions against the Children's Bureau are an injustice to the splendid work done by the Children's Bureau at a time when there was not a state in the western part of the Union—I do not know so much about the east, but it certainly was the Children's Bureau that brought prenatal care to the farmers' wives. The Agricultural Bureau had spent millions upon the prenatal care of horses and asses but not a penny on the care of women, and I think it would be a sorry day for us to go

on record as opposing a movement which is bound to bring much benefit to the women of the United States. (Applause.) (Carried.)

9. "Teaching undergraduate obstetrics," by Dr. Arthur M. Mendenhall, Indianapolis, Indiana.

This paper was discussed by Drs. Otto Schwarz, Polak, Bell, Condit, James E. Davis, and closed by Dr. Mendenhall.

10. "The action of the commoner ecbolics in the first stage of labor," by Dr. M. Pierce Rucker, Richmond, Virginia.

Discussed by Drs. Dickinson and Bill, and, in closing, by the essayist.

11. "A method of delivery in normal cases," by Magnus A. Tate, Cincinnati, Ohio.

This paper was discussed by Drs. Potter, Bill, Rucker and Henry Schwarz; and the discussion closed by Dr. Tate.

12. "The choice of methods of making labor easy," by Dr. Arthur H. Bill, Cleveland, Ohio.

This paper was discussed by Drs. Potter, Bell, Zinke and Tate, and in closing by the essayist.

13. "Demonstration of the mechanism of labor," (Moving picture exhibition) by Dr. J. F. Moran, Washington, D. C.

This presentation was not discussed.

At this point the Secretary announced that cases were being prepared for Dr. Potter in Barnes Hospital, and requested all who wished to attend his demonstration of version to leave their names and room numbers with the Secretary.

14. "Ten years of experience in painless childbirth," by Dr. George Clark Mosher, Kansas City, Missouri.

Discussed by Drs. William H. Condit and Roland E. Skeel, the discussion to be continued at the Wednesday morning session.

On motion, the Association adjourned at 6:45 P.M. until 9:00 A.M. Wednesday, September 21.

SECOND DAY—*Wednesday, September* 21, 1921

Morning Session.—The Association was called to order at 9:15 A.M. by First Vice-President, Dr. Benjamin R. McClellan, who announced that Dr. Mosher had been called home and therefore the discussion on his paper would be considered closed.

15. "An analysis of the Potter version," by Dr. Edward Speidel, Louisville, Kentucky.

The discussion on this paper was opened by Dr. Irving W. Potter and continued by Drs. Rucker, Dorsett, Otto Schwarz, and Bill; and, in closing, by the essayist.

16. "Treatment of eclampsia; then and now," by Dr. J. F. Moran, Washington, D. C., (by invitation).

This paper was discussed by Drs. Zinke, Polak, Tate, Rucker, and James E. Davis, and the discussion closed by the author.

17. "A study of ectopic pregnancy, with special reference to the cause of the metrorrhagia," by John Osborn Polak and Thurston S. Welton, Brooklyn, N. Y.

This paper was discussed by Dr. Hayd.

SYMPOSIUM ON CANCER

18. "Carcinoma uteri," by Dr. Charles L. Bonifield, Cincinnati, Ohio.

19. "Some phases in the evolution of the diagnosis and treatment of cancer of the cervix," by Dr. Roland E. Skeel, Los Angeles, Cal.

20. "Valuable methods used to extend operability in advanced cancer of the cervix," by Dr. G. VanAmber Brown, Detroit, Michigan.

21. "The control of the mortality of abdominal operations for cancer," by Dr. George W. Crile, Cleveland, Ohio.

This symposium was discussed by Drs. George Gellhorn (by invitation), Thos. B. Noble, Bainbridge, James E. Davis, Miles E. Porter, and the discussion was closed by Drs. Skeel, Brown and Crile.

22. President's Address, by Dr. Henry Schwarz, St. Louis.

On motion the Association took a recess until 2:00 P.M.

Afternoon Session.—The Association reconvened at 2:20 P.M. and was called to order by First Vice-President, Dr. Benjamin R. McClellan.

23. "Teratoma of the ovary. Report of a case," by Dr. Miles F. Porter, Fort Wayne, Indiana.

This contribution was discussed by Dr. Hugo O. Pantzer.

24. "New trend in gynecological therapy," by Dr. George Gellhorn, St. Louis, Missouri, (by invitation).

This paper was discussed by Drs. Polak, Tracy, Pantzer, Dickinson, Taussig, G. VanAmber Brown, Ruth, Skeel, and Miles F. Porter, and, in closing, by the essayist.

25. "Chronic infectious enlargements of the vulva," by Dr. Fred J. Taussig, St. Louis, Missouri, (by invitation).

This paper was discussed by Drs. James E. Davis and Gordon K. Dickinson and the discussion closed by the author.

26. "Traumatic inflammation of the fundus of the bladder," by Edgar A. Vander Veer, Albany, N. Y.

This paper was discussed by Drs. Dickinson and Miles F. Porter.

27. "Strictures and atresias of the vagina," by Dr. James E. King, Buffalo, N. Y.

This paper was discussed by Drs. Moots, Taussig, Potter, Ruth, and Pantzer and the discussion closed by Dr. King.

28. "A study of the cases of carcinoma mammae, operated upon by myself, and the end results obtained in them," by Dr. James E. Sadlier, Poughkeepsie, New York.

This paper was discussed by Dr. Lewis F. Smead.

On motion the Association adjourned to go into Executive Session, and to reconvene at 9:00 A.M. Thursday, September 22.

THIRD DAY—*Thursday, September* 22, 1921

Morning Session.—The Association was called to order by Second Vice-President, Dr. James E. King, at 9:10 A.M.

29. "Gynecological operations under local anesthesia, with lantern slides and motion picture demonstrations," by Dr. Robert Emmett Farr, Minneapolis, Minnesota.

This paper was discussed by Drs. Gellhorn, Rongy, and Bainbridge and, in closing, by the essayist.

At this point, on motion of Dr. Miles F. Porter, seconded by Dr. Hayd, and duly carried, the Scientific Session adjourned to go into Executive Session for a few minutes to consider a matter of importance. At the conclusion of the Executive Session the Scientific Session was again called to order by Dr. King and the presentation of papers was continued.

30. "Suppurating myomata of the uterus," by Dr. Wm. Edgar Darnall, Atlantic City, N. J.

This paper was discussed by Drs. Otto Schwarz, and Bell and the discussion closed by Dr. Darnall.

31. "Frequent failure to recognize ureteral obstruction is responsible for many unnecessary pelvic and abdominal operations," by K. Isadore Sanes, Pittsburg, Pa.

This paper was discussed by Drs. Polak and Zinke and, in closing, by the essayist.

32. "The indications for, and the dangers in the use of, spinal anesthesia in obstetrics, gynecology and abdominal surgery," by Dr. R. R. Huggins, Pittsburg, Pa.

This paper was discussed by Drs. Gellhorn, Bainbridge and Henry Schwarz, and the discussion closed by Dr. Huggins.

33. "Kidney neoplasia with report of five primary cases," by Dr. James E. Davis, Detroit, Michigan.

This paper was discussed by Dr. Gellhorn and the discussion closed by the essayist.

34. "The value of routine examinations under anesthesia preliminary to abdominal surgery," by Dr. John W. Keefe, Providence, R. I.

This presentation was discussed by Drs. Rufus B. Hall, and Miles F. Porter and, in closing, by the essayist.

On motion the Association took a recess until 2:30 P.M.

Afternoon Session.—The Association reconvened at 2:30 P.M. and was called to order by the President, Dr. Henry Schwarz.

35. "Oxygen in the peritoneal cavity, with report of six cases," by Commander William Seaman Bainbridge, M.C., U.S.N.R.F., New York City.

This paper was discussed by Drs. Rongy, Tracy, and H. J. Scherck, St. Louis, and the discussion closed by Dr. Bainbridge.

36. "Transperitoneal nephropexy," by Dr. Thomas B. Noble, Indianapolis, Indiana.

This contribution was discussed by Drs. R. E. Skeel, Sanes, Moots and Miles F. Porter and, in closing, by Dr. Noble.

37. "Coincident ruptured ectopic gestation and acute suppurative appendicitis," by Dr. Charles E. Ruth, Des Moines, Iowa.

This paper was discussed by Dr. Tracy.

38. "The use of the ice cap in acute appendicitis," by Dr. Charles W. Moots, Toledo, Ohio.

This paper was discussed by Drs. Wetherell and Rongy, and the discussion closed by Dr. Moots.

39. "Torsion of appendicitis epiploicae," by Dr. Benjamin R. McClellan, Xenia, Ohio. (No discussion.)

40. "Transuterine insufflation, a diagnostic aid in sterility," by Dr. A. J. Rongy, New York City.

This paper was discussed by Drs. Moots and King and the discussion was closed by the essayist.

41. "Anomalous location of the duodenojejunal junction," by Dr. Budd Van Sweringen, Fort Wayne, Indiana. (Read by title only.)

THE PRESIDENT.—The next thing on the program is the memorial service. We have lost four Fellows, three regular and one honorary, in the year just closed. We have lost two men in Detroit, Dr. Longyear, an Ordinary Fellow, and Dr. Theodore A. McGraw, an Honorary Fellow.

Dr. J. E. Davis read the Memorials as requested and they will be found elsewhere in the Transactions.

THE PRESIDENT.—The Memorial prepared by Dr. Baughman for Dr. Lewis C. Bosher of Richmond will be read by Dr. Rucker, as Dr. Baughman is not present, and the Memorial prepared for Dr. Charles A. Stillwagen, which was to have been presented by Dr. Weiss, will appear in the Transactions, with the other three.

Dr. Rucker presented the Memorial for Dr. L. C. Bosher.

THE PRESIDENT.—The time has now come for the induction of the new officers. Before I give up this chair to which you see me clinging so persistently, I wish to assuage the rather sharp presidential action of yesterday morning. That was really just a campaign (laughter); I wanted to make sure they would make me a member of the Council so that I could remain in office for three years. (Laughter and ap-

plause.) As my friend, Dr. Miller, inserted the word "seemingly" in the motion to take out all the harshness, I wish these remarks to serve. That will be just a little history and I want it in words that will please the Senior Dr. Vander Veer. (Laughter.)

I want to thank you all for your cooperation for you have made my task easy. It was really no work at all; everybody did what was necessary at the moment, and I am particularly indebted to the Secretary, the First Vice-President and the Second Vice-President, who were always willing to forego their convenience to allow me to be here and there and everywhere, as a fellow wants to be during Convention week.

DR. BAINBRIDGE.—Before our new officers are ushered in, I wish to make the motion that it be the sense of the Association that they wish to express their appreciation of the courtesy and fellowship of the President now leaving the Chair, and our thanks to the Committee for the splendid time we have had here in St. Louis.

Seconded by Dr. McClellan.

DR. A. B. MILLER.—I think it would be proper to incorporate here the indefatigable work of the local Fellows as shown here, along with the Chairman of the Entertainment Committee, and certainly our hearts are warm toward them for what they have done toward entertaining us, and I would like to include in that motion the Entertainment Committee, and the management of the hotel for the cooperation they have shown in making our visit pleasant.

Dr. Bainbridge accepted the amendment, the motion was put by the Secretary, and carried unanimously by a rising vote.

DR. MCCLELLAN.—Was there not a committee to be announced before adjournment?

THE PRESIDENT.—It was the understanding that the incoming President and the Executive Council would take care of that.

I will now appoint two of our young, strong men to escort the President-elect to the platform, Dr. Wetherell and Dr. Otto Schwarz.

Dr. Skeel was escorted to the platform and in presenting his successor Dr. Schwarz said:

Dr. Skeel, nothing could give me more pleasure than to have for my successor a man who has learned so well how to obey in the last few years. I am very happy to turn the gavel over to you. (Applause.)

DR. SKEEL.—Mr. Secretary, Gentlemen: I think that a speech is not exactly in order at this time. The only thing I might say is that in considering merely my predecessors of the post-war period and the Fellows of this Association, when one has been elected to succeed such men and fill an office which will put him at the head of the Associa-

tion for the next year, he can but be so thoroughly impressed with the confidence which has been shown him, and which he in nowise deserves, that he must by all means reserve his expressions until the end of his term of service.

There is, I think, only one little philosophical thing I might say. I presume it has happened to all of us—it certainly has happened to me, that any official position we have been chosen for has always seemed to be too great for the man who has been chosen, and the only thing to do is to make an effort to live up to the office one has been chosen to fill. (Applause.) I thank you all.

The Secretary reports that the two Vice-Presidents are absent so they cannot be inducted into office at this time. The only thing that remains, therefore, is to induct another officer into office. I wish to introduce to you a new member of the Association and a new officer, Dr. Gustav Zinke, the Secretary! (Laughter and prolonged applause.)

On motion, duly seconded and carried, the Association adjourned *sine die.*

E. GUSTAV ZINKE, M.D., *Secretary.*

EXECUTIVE SESSIONS

Tuesday, September 20. 1921

The President, Dr. Henry Schwarz, in the Chair.

THE PRESIDENT.—The first business before the session this morning is the election of new members. The Secretary will read the list of those candidates who have been recommended by the Executive Council for Fellowship.

THE SECRETARY.—Your Executive Council has recommended the following applicants: Drs. A. Y. P. Garnett, Washington, D. C.; Paul T. Harper, Albany, New York; Burnley Lankford, Norfolk, Virginia; Edward B. Montgomery, Quincy, Illinois; J. F. Moran, Washington, D. C.; William Pfeiffer, Brooklyn, New York; Henry Schmitz, Chicago, Illinois; and Frederick S. Wetherell, Syracuse, New York.

THE PRESIDENT.—Gentlemen, you have heard the list read by the Secretary of the applicants recommended by the Council. You will find all the details on page 25 of your program. What is your pleasure?

DR. DICKINSON.—I move you, Sir, that the rules be suspended and that the Secretary cast the vote of the members present in favor of these candidates. Seconded by Dr. Pantzer. Carried.

THE PRESIDENT.—The Secretary will please cast the vote of the Association in favor of these candidates.

The Secretary reported the vote cast and these gentlemen were declared duly elected to fellowship.

THE PRESIDENT.—What is the next business, Mr. Secretary?

THE SECRETARY.—The selection of the next meeting place would be in order.

THE PRESIDENT.—There are so few members present at this time that I think this should be postponed until the next session. What else is there to come up?

THE SECRETARY.—Dr. Humiston of Cleveland has expressed a desire to be placed on the retired list, owing to ill health. He has been President of the Association, an active Fellow for the last 26 years, and a member of the Executive Council. Executive Council recommends that he be made an Honorary Fellow of the Association.

DR. BAINBRIDGE.—I move that this action of the Council be concurred in by the Association. Seconded by Dr. Poucher. Unanimously carried.

THE PRESIDENT.—Mr. Secretary, is there any more business before the Executive Session?

THE SECRETARY.—The report of the Secretary and Treasurer. As Secretary, I am pleased to report that the Association received $3,254.55 during the past year. Of this there was expended $3,110.25, leaving a balance of $144.30.

THE TREASURER.—I am pleased to report that there is at this time $32.98, plus a bond for $1000.00 in the treasury.

THE PRESIDENT.—Gentlemen, you have heard the report of the Secretary and Treasurer. The Chair will receive a motion that he appoint an auditing committee.

DR. KING.—I move that an auditing committee be appointed by the Chair. Seconded by Dr. Pantzer. Carried.

The President thereupon appointed the following Auditing Committee: Drs. Aaron B. Miller, Charles L. Bonifield and Hugo O. Pantzer.

DR. HAYD.—Mr. President, Dr. Bonifield is not present at this time, and I would, therefore, suggest the appointment of Dr. Rufus B. Hall to serve on this committee in his place.

The Chair thereupon appointed Dr. Hall a member of the Auditing Committee.

THE PRESIDENT.—There is no further business to come up at this time, so we will now adjourn until 5 P.M. Wednesday.

Wednesday, September 21, 1921

The President, Dr. Henry Schwarz, in the Chair.

THE PRESIDENT.—The first order of business is the report of the Auditing Committee.

DR. RUFUS B. HALL.—The Chairman is not present, but I am pleased to report that the accounts were carefully audited and found to be correct in every particular.

THE PRESIDENT.—A motion to receive this report and file it is in order.

DR. MILES F. PORTER.—I move that the report be accepted and placed on file.

Seconded by several members and carried.

THE PRESIDENT.—The next order of business is the election of officers. The first officer to be nominated is the President.

DR. KEEFE.—I wish to place in nomination Dr. Roland E. Skeel of Los Angeles. He is a man who has been with us for many years, with the exception of the time he spent in the war, and I think each man will feel that he has endeared himself to all of us. His professional ability I feel cannot be excelled. I wish to place his name in nomination. (Applause.)

DR. MILES F. PORTER.—I would like to second the nomination most heartily, and move that the nominations be closed and that the Secretary cast the ballot of the Association in favor of Dr. Skeel.

Seconded by Dr. Polak and carried.

THE SECRETARY.—It affords me great pleasure to cast a favorable vote for Dr. Skeel.

THE PRESIDENT.—The Secretary has cast the vote and Dr. Skeel is duly elected. (Applause.) The next officer to be nominated is a first vice-president.

DR. RUFUS B. HALL.—Inasmuch as I have talked so much and been on the floor so often during this session I thought I would get up and talk again. (Laughter.) I wish to place in nomination one of the younger members of our Association, a man we all honor and like and love, not only for his own merits and personal qualifications, but because of the family he represents. A man with whom the future of the Association will be assured. I wish to place in nomination, Sir, Edgar A. Vander Veer of Albany, for First Vice-President. (Applause.)

Seconded by Dr. Dickinson, who moved that the nominations be closed and that the Secretary cast the ballot of the Association for

Dr. Vander Veer. The motion was supported by several members, and carried.

THE SECRETARY.—I take great pleasure in casting the ballot for Dr. Vander Veer as First Vice-President.

THE PRESIDENT.—The Secretary reports the ballot cast and I declare Dr. Vander Veer elected. (Applause.) The next office to be filled is that of Second Vice-president. Nominations for that office are now in order.

DR. MCCLELLAN.—I rise to place in nomination another young man, who I think has shown himself worthy of this office. I nominate, sir, Dr. Arthur H. Bill of Cleveland. (Applause.)

Seconded by Dr. Chandler.

DR. KEEFE.—I move that the nominations be closed and that the Secretary cast the unanimous vote of the Association for Dr. Bill.

THE SECRETARY.—I am very glad to cast the vote favorable to Dr. Bill.

THE PRESIDENT.—The Secretary has cast the vote for the election of Dr. Bill and he is now duly elected. The next vote will be for Secretary.

DR. DICKINSON.—I move you, Sir, that the present incumbent, Dr. Gustav Zinke, be asked to act as Secretary for another year, and that the Assistant Secretary, Dr. James E. Davis, cast the vote of the Association for Dr. Zinke.

The motion was supported by Drs. Polak, Keefe and several others and carried.

DR. JAMES E. DAVIS.—It gives me much pleasure to cast the vote for Dr. Zinke.

THE PRESIDENT.—Dr. Davis has now cast the ballot and Dr. Zinke is, thereby, elected as our Secretary for another year. (Applause). Nominations are now in order for an Assistant Secretary.

DR. BAINBRIDGE.—I move that our present Assistant Secretary, Dr. J. E. Davis, be reelected.

Seconded by Dr. Bell and carried.

DR. MCCLELLAN.—I move that the rules be suspended and that the Secretary be instructed to cast the ballot for Dr. Davis.

The Secretary reported the ballot cast and Dr. Davis was declared duly elected.

THE PRESIDENT.—The next officer to be nominated is that of treasurer. That is a very responsible position and I took a moment to think it over. Nominations are now in order.

DR. RUFUS B. HALL.—Do you see anyone in the congregation that needs money? (Laughter.)

DR. JONES.—I move that Dr. Hayd, our present Treasurer, be reelected, that the rules be suspended and the Secretary be instructed to cast the ballot.

Supported by Dr. Bainbridge and carried.

THE SECRETARY.—I take great pleasure in casting this ballot for Dr. Hayd, Mr. President.

THE PRESIDENT.—The Secretary has cast the ballot and Dr. Hayd is reelected unanimously. The next offices to be filled are the vacancies which naturally occur every year in the Executive Council, we need two new members.

THE SECRETARY.—Only one besides yourself, Mr. President. The retiring President, *eo ipso,* always becomes a member of the Council.

THE PRESIDENT.—I know that has been done, but I know of no authority for such a proceeding. I will put it to a vote.

DR. A. B. MILLER.—We are not surprised, Mr. President, at the conclusions you have drawn regarding the work of the Association, but as a member for many years I know some of your conclusions are fallacious and, while it may not appear in the Transactions, I know this has been a matter of due form in the Society and the mere fact that it does not appear in the Transactions does not mean that it is not a matter of law for the retiring President to take a place on the Executive Council. The President does succeed to the Council and if you find the minutes written as they should be, this fact will be evident. I am glad to tell the members of the Association this fact. I am capable of telling untruths, but this is a fact. (Laughter and applause.)

THE PRESIDENT.—I am glad to hear Dr. Miller give this explanation. My scruples have been overcome. (Laughter.) I did not intend to come into the Council under false pretenses for I intend to take an active part if I am entitled to do so, and I shall be glad to serve. Nominations are now in order for one member of the Council.

DR. HAYD.—I wish, Mr. President, to enter the nomination of Dr. Weiss of Pittsburgh, and in doing so I wish to say that, perhaps next to the position of President, there is no more important position in the Association than that of being on the Executive Council. I am sure you all realize that the Association has been run, for the last ten or fifteen years, at least, by the older men in the Association. We all realize that it is necessary, in order to perpetuate the work that

has been done in the Association, to have active young men succeed us. I know of no young man in the Association to whom I feel that the work can be so splendidly delegated as to Dr. Weiss of Pittsburgh.

DR. A. B. MILLER.—I wish to second the nomination of Dr. Weiss and also to correct the last speaker. I wish to correct the thought that the Association has been run by the older members. It was not Dr. Hayd's thought, I am sure. Some of the older members have taken it to heart and have made some suggestions, but not with the thought for a moment that we wish to run this organization. It was only to make suggestions and if they are not well met at any time we hope the Association will correct us.

DR. HAYD.—That was what I intended to convey, gentlemen, by my remarks.

THE PRESIDENT.—Dr. Weiss has been nominated and the nomination has been seconded. Are there any other nominations?

DR. BAINBRIDGE.—I move that the nominations be closed, that the rules be suspended, and that the Secretary be instructed to cast the ballot of the Association for Dr. Weiss.

Supported by several and carried.

The Secretary cast the ballot as instructed and Dr. Weiss was declared duly elected.

THE PRESIDENT.—The next order of business is the selection of a place for our next meeting.

THE SECRETARY.—We have received a number of invitations, Cleveland, Chicago, Toledo, New York, and Albany, and inasmuch as Albany never has had a meeting of our Association the Executive Council would prefer the selection of the City of Albany, New York, for the next meeting.

DR. VANDER VEER.—On behalf of the Hudson River Fellows, I take great pleasure in moving that the next meeting be held in Albany. We have a good hotel there and we will give you a fine meeting place. We think we ought to have the meeting, never having had it in Albany before. As I remember, this Association, while not born in Albany, it was conceived there, and it would seem fitting that the thirty-fifth meeting should be held in the place of its conception. (Laughter and applause.) Seconded by Dr. Tate.

THE PRESIDENT.—Before I put the question I wish to say to the younger members who do not quite understand the secret of conception (laughter), that the speaker refers to Dr. Vander Veer, Senior, of Albany, who was not only one of the founders, but one of the prime

movers in the organization of this Association. The Doctor is still living and capable of participating in our gatherings if we go to him, but he is now too far advanced in years to come to distant places. So it will be a fine thing for a man we all wish to honor if you will all cast your votes in the affirmative.

Motion put and unanimously carried, by rising vote.

As there was no further business to come before the executive session, on motion the session adjourned to reconvene at the call of the President.

Thursday, September 22, 1921

The President, Dr. Henry Schwarz, in the chair.

Dr. Hayd.—We felt that there was a very important matter that should be considered by the Association and consequently that it was best for us to consider that subject by going into Executive Session at this time, so that all the members should know just what the objects of this meeting were.

All of you know that a new journal has been started and has taken the place of the old Blue Book published by William Wood & Company. The William Wood Company took all of our papers and gave us, in return, those papers set up so that we could use them for our Transactions. All the expense we were subjected to was for the binding of the sheets, which made it a very simple and comparatively cheap matter. Now, unfortunately, a new situation has arisen, whether through a misunderstanding on the part of the publisher or on the part of our Secretary does not matter. We have the facts and they are these: First of all, this new journal will not publish purely surgical papers because it is a journal for obstetrics and gynecology. Consequently, a certain number of our papers will not be published in this Journal and, therefore, some of us have thought it was best to state to the members that they are privileged to publish their papers where they like, particularly those that are purely surgical.

However, in view of the fact that this Journal has been started, and because we are interested in a special journal for our specialty, I think it is only natural that we should give our moral and physical support to that publication in the hope of building up a journal for the specialty of gynecology and obstetrics. The American Gynecological Association is not enjoying any more privileges than this Association. They have to get out their own transactions, at a cost last year of $1960.00. You can see it will cost us at least a like amount for our Transactions. Of course, they can be cheapened. There is no object in getting out such a beautiful volume as we have. The object of the transactions is to get out, bound together, the papers which are presented,

for our future use. The Transactions can be cheapened considerably and to that end the subject will have to be considered.

The Executive Committee of this Journal, or the editors, have a right to delete, or not accept, any papers that are not agreeable to them as editors. As a result—I will be a little bit specific and a little bit invidious—such a splendid paper as Dr. Keefe's of last year was not published. Why? Because a similar paper was published a few months previously on that subject!. Such things will cause a good deal of discontent and unless we, as a society, understand the situation there will be an unnecessary amount of criticism.

Now, gentlemen, do not think we are bankrupt. We are not. We have $1350.00 in the treasury, but as Treasurer of the Society I realize what is coming and I do not wish to have any discontent among the members.

Dr. Miles F. Porter.—Gentlemen, I think you have had the situation put to you pretty clearly. I would like to emphasize one thing before offering a resolution, and that is that these people will take nothing but the gynecological and obstetrical papers and throw the rest out. In other words, it is a sort of a game of tails I win, heads you lose. I would like to offer the following resolution:

"WHEREAS, the present arrangement for the publication of the papers read before this Association is incomplete, unfair and, therefore, unsatisfactory, and

"WHEREAS, said arrangement if carried out will greatly increase the cost of the publication of the Transactions, therefore

"BE IT RESOLVED that a committee of five be appointed, of which the President, Secretary and Treasurer shall be members, to arrange for the publication of the papers and the annual volume of Transactions in a manner in keeping with the dignity of the Association and the self-respect of the individual Fellows."

I move, you, Sir, the adoption of this resolution.

Supported by Dr. Bainbridge.

Dr. A. B. Miller moved to amend by placing the word "seemingly" before the word "unfair" in the first paragraph of the preamble.

This amendment was accepted by Dr. Bainbridge, seconded, and the original motion, as amended, was put to a vote and carried unanimously.

Dr. Miller.—I move that this committee be enlarged at the discretion of the President.

Supported by Dr. Hayd and unanimously carried.

The President.—There is one more motion to be voted upon. We received the resignation this morning of a Fellow of long standing, Dr. Willis F. Westmoreland of Atlanta, Professor of Surgery at the Atlanta

Medical College. Your Executive Council in extra session considered this case and thought his was one of the very cases for which our Senior Fellowship had been created. So your Council recommends Dr. Westmoreland of Atlanta to Senior Fellowship.

On motion, duly seconded and unanimously carried, Dr. Westmoreland was declared elected to Senior Fellowship.

As this completed the business of the Executive Session, on motion, duly seconded and carried, the Session adjourned *sine die.*

E. GUSTAV ZINKE, M.D., *Secretary.*

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PAPERS

READ AT THE

THIRTY-FOURTH ANNUAL MEETING

OF THE

AMERICAN ASSOCIATION

OF

OBSTETRICIANS, GYNECOLOGISTS

AND

ABDOMINAL SURGEONS

HELD AT THE

STATLER HOTEL

ST. LOUIS, MISSOURI

SEPTEMBER 20, 21, AND 22, 1921.

THE PRESIDENT'S ADDRESS

By Henry Schwarz, M.D., F.A.C.S., St. Louis, Mo.

At the Atlantic City meeting a year ago when I was unable to attend, you conferred on me the distinctive honor of your presiding officer for the meeting of 1921.

This, therefore, is the first opportunity I have to express my sincere thanks for your great kindness and to assure you that no one knows better than I do that there are many fellows in our Association more deserving and better fitted for the task than I am. However, I have accepted your gift with humility and with your friendly cooperation and kind indulgence I shall do the best I can to live up to your expectations.

The affairs of the Association are in flourishing and satisfactory condition. Membership and attendance at the annual meetings have increased steadily. Starting with a membership of 40 and an attendance of 24 at the first annual meeting held in Washington in 1888, the membership in 1894 at Toronto passed the hundred mark, never again to fall below it; in 1910 at Syracuse the hundred-and-twenty-five mark was passed, never again to be lowered, and now, in 1921 in St. Louis we have reached a new high record of 140 members. It is safe to predict, that at the annual meeting in 1923 we will have a membership of 150, and a respectable waiting list.

The attendance was above fifty at Louisville in 1911 and has never since fallen below that mark, with the exception of the year 1918, when, owing to the war, it fell to thirty-eight. Toledo holds the record for large attendance; when we met there in 1912, seventy fellows registered—that is more than 52 per cent of the membership.

The papers offered by our Fellows and the discussions which they brought out have kept up the high standard set by the founders of the Association, so that the Transactions are indeed a proud and lasting monument to the activities of the founders of this Association and to those who labor after them and who, one by one, lay themselves down to rest, satisfied that the work that they so successfully started will be carried on in their spirit in this Association as long as medical science and medical art shall flourish in this western hemisphere.

I am entirely in accord with the remarks made by Vice-president Hadden last year, when he said, at the close of the scientific session, he could not believe that the energy stored up in us and the mental powers that are ours, will entirely cease after death. Dr. Hadden may rest assured, that the spirit of the man whose absence he so deeply de-

plored, with the spirits of other departed Fellows, whose hearts and souls were wrapped up in the work of our Association, and whose very presence was an inspiration to the rest of us, will forever be among us at our annual meetings and I, for one, love the spirit of Henry Carstens, and fear his criticism just as much as I did when he walked in the flesh.

This year the Association deplores the death of three of its members:

Dr. Lewis C. Bosher of Richmond,
Dr. H. W. Longyear of Detroit, and
Dr. Charles A. Stillwagon of Pittsburg.

Addresses have been prepared by fellow-members who knew them best. These will be read at the close of the scientific program and they will be incorporated in the Transactions.

Among the younger members of our Association, of whom we expect so much and who, if needs, must be the arbiters of its future, there seems to be much confusion regarding the earlier history of the Association and at times they are at a loss to explain the existence of two National Societies for the same special branches of medicine.

For the benefit of these younger members and likewise for the benefit of those who lately have tried to bring about highly desirable changes in our Constitution and By-laws without strict adherence to rules, I shall give what may be called a short

CONSTITUTIONAL HISTORY OF OUR ASSOCIATION

At the meeting of the American Surgical Association in 1887, the subject of the Organization of the Congress of American Physicians and Surgeons, the bringing together of the various special societies was pretty thoroughly discussed. Later, sometime before the annual meeting of 1888, Dr. William H. Marsten, of Mobile, Chairman of the Committee on Organization, informed Dr. Albert VanderVeer of Albany, that the American Gynecological Society declined to participate. He was greatly disappointed by their action and was anxious to have another society organized that would include gynecology and, after further discussion, obstetrics. (From Dr. VanderVeer's article in Vol. xxiii of the Transactions.)

On April 19 of the same year the initial meeting which led to the formation of our Association was held at Buffalo. Dr. Thomas Opie, of Baltimore, was temporary chairman. The committee to draw up a Constitution and Bylaws consisted of

Dr. Albert VanderVeer of Albany,
Dr. E. E. Montgomery of Philadelphia and
Dr. Byron Stanton of Cincinnati.

All three of these founders are still alive. They drew up a Constitution and By-laws which have stood the test of time.

Article I of the Constitution read: The name of this Association shall be The American Association of Obstetricians and Gynecologists, and Article II read: Its object shall be the cultivation and promotion of knowledge in whatever relates to obstetrics, gynecology, and abdominal surgery.

The Constitution and By-laws were adopted and permanent organization was perfected. On motion the annual meeting was appointed to be held in Washington, September 18, 19 and 20, 1888.

The Secretary was directed to prepare the program and to make official application for the admission of the Association to the Congress of American Physicians and Surgeons.

The American Gynecological Society met in the same city and on the same dates in the year 1888. It had undergone a change of mind. On September 18, the first day of the meeting, upon motion of Dr. Fordyce Barker, the order of business was suspended and the resolution of the previous year, declining to enter the Congress of American Physicians and Surgeons, was rescinded and Dr. Barker's motion to go into the Congress was unanimously passed. On motion of Dr. Busey, Dr. Barker was appointed from the Gynecological Society as a member of the Executive Committee of the Congress.

The evening of that same day, the Executive Committee of the Congress held a special meeting at the Willard Hotel in which it unanimously resolved not to consider the application of any society which had not held at least two annual meetings. Notice of this resolution reached our Society officially on September 19. In the meantime word had been passed that if our Society would change its name so as to leave out the Gynecology and make it either Obstetrics or Pelvic Surgery, it would be welcome as a member of the Congress. These unofficial overtures explain the attempt to change the name of our Association at its first annual meeting.

Dr. Thomas Opie suggested that the name of the Association be changed to The American Association of Obstetricians. After some discussion it was decided that as the question involved a change in the Constitution it would necessarily lie over until next year; whereupon Dr. E. E. Montgomery offered the following in writing:

That Section 1, Article I, of the Constitution be changed to read as follows: The name of the Association shall be "The American Association of Obstetricians."

At the second annual meeting held at Cincinnati in September, 1889, Dr. Montgomery asked unanimous consent to withdraw his proposed amendment to the Constitution offered at the last meeting, relating to the name of the Association. His request was granted. Thus ended

the first attempt to change the name of our Association. A second attempt was made at Louisville in 1900. Dr. Carstens proposed the selection of a new name for the Association. After considerable discussion, Dr. John B. Deaver offered the following resolution:

"Resolved that the name of the American Association of Obstetricians and Gynecologists be changed to the American Society of Abdominal Surgeons."

Under the rules this resolution lay over until 1901, when at Cleveland, it was moved for adoption. The motion was duly seconded and after very spirited discussion the question was put and the resolution lost.

The changes in the Constitution and By-laws which were actually made from time to time concerned, principally, annual dues and the limitation of membership, with two notable exceptions, namely, the increase of the number of councilors from five to six, which was adopted at Pittsburg in 1898, and the creation of Senior Fellows, which took place in 1911 at Louisville.

The attempt to change the number of councilors led to a sort of uprising among the plain members of the Association against the benevolent but unauthorized usurpation of power by the Executive Council.

At Richmond in 1896, Dr. McDonald offered a resolution to change the number of councilors, which, under the rules, laid over till 1897, when it was taken up at Niagara Falls. The President claimed that the resolution had not been presented in accordance with the Constitution as printed in Vol. IX of the Transactions for 1896. Dr. McDonald stated his resolution was offered in accordance with the Constitution as printed in Vol. VIII of the transactions, Vol. IX not being in existence at the time.

After a very lively discussion it was decided that the Association was conducting its business according to the printed Constitution in Vol. VIII of the Transactions for 1895, and that in future it be so considered the Constitution of the Association.

Volume IX of the Transactions, among other unauthorized changes contained the following: The nomination of all officers shall be made by the Executive Council; while in Vol. VIII it simply reads: The nomination of all officers shall be made in open session.

At Pittsburg in 1898 the number of Councilors was raised to six; the Executive Council gave back to the rank and file their constitutional rights in a report which read in part as follows:

The Council has sometimes deemed it for the best interests of the Association to nominate officers, but now, under the Constitution of 1895, reaffirmed last year as the organic law of the organization, it

leaves this question entirely in the hands of the Association without suggestion.

The Council, however, holds itself in readiness to obey any order of the Association which may be delegated to it by vote.

The Council was so eager to stick to the Constitution of Vol. VIII that it considered legally effected changes which had taken place between the time of its publication and between the time at which it was so energetically proclaimed the organic law of our Association, cancelled.

At Richmond the limitation of fellowship had been raised to 150. You will find it so stated in the Transactions for 1896 and 1897, but in the Transactions for 1898 you will find it again to read 125. It remained at the latter figure until it was again raised to 150 at the Chicago meeting in 1903.

The fact that we ought not now to go back of Constitution as printed in Vol. VIII perpetuates a curious mistake made by the printer of the first three volumes of the Transactions. In Vol. I, we read: The Secretary shall be ex-officio clerk of the Council, but he shall not be entitled to vote therein; Vol. II says "but he shall be entitled to vote therein," and Vol. III says "and he shall be entitled to vote therein." Of course, the Secretary should have no vote in the meetings of the Executive Council. The President has no vote except in the case of a tie.

We are again approaching a period at which the members must assert their right and insist that the Council proceed strictly along constitutional lines, no matter how desirable certain changes in Constitution and By-laws may appear. If the membership dues have to be raised, the Fellows are perfectly willing to vote for a raise and to pay increased dues voluntarily until the change in Constitution and By-laws can be brought about according to rule.

Compare Constitution and By-laws as printed in Vol. XXXII, and in Vol. XXXIII, and examine in how far the changes you find there have been authorized according to rule. Under Article III of the Constitution you find that candidates for fellowship must be proposed three months before the first day of meeting, and must submit to the Council an original paper at least three months before the annual meeting.

Who authorized such a change? It is true that the Secretary stated that in his circular report of the 1920 meeting, dated October 7, 1920, that he had overlooked the resolution presented the year before that applicants for fellowship must send in their applications, including thesis, not later than six months prior to the next meeting, and that there being no doubt that this resolution would have passed we should act accordingly, but these facts give him no right to change

the printed Constitution, and why did he change the time from six months to three months?

The fact is that the resolution offered by Dr. Bonifield had asked for a period of nine months. And what has become of the resolution offered by Dr. Erdmann, that all candidates for admission to the Association hereafter must be graduates of not less than five years' standing, and must be teachers or visiting, or assistant-visiting surgeons to some standardized hospital?

Under Article VI you find that the officers of the Association are increased by an Assistant Secretary; we need an assistant secretary it is true; the Council recommended this change and the Fellows present at the meeting supported the Council, but the matter was not brought up in proper resolution; it was not laid over one year, and no notice of the contemplated change was given in last year's program. The same applies to the raising of the annual dues, and last but not least, to the change in the name of the Association.

No notice of the contemplated change was given in last year's program as the rules prescribe; there is no evidence that the question was properly put and carried. The rules prescribe that a two-third majority of all Fellows present at a meeting is required. There were fifty-seven Fellows present at the Atlantic City meeting and it required thirty-eight votes to effect a change in the Constitution or By-laws. The framers of our Constitution used the word "meeting" advisedly; they did not mean the number of Fellows present at any one session of the meeting. Besides, the printed record does not show that the question was put at all.

The printed record shows that after considerable discussion the President, in order to feel the disposition of the Fellows present, said: "Let us take a straw vote." He then put the question and it was unanimously carried.

It looks to me that the Executive Council should straighten out this matter and I suggest to that body that it meet from time to time to consider the affairs of the Association, for in the long run we do not desire to be taxed without representation, nor do we wish to be governed by Orders in Council.

DIABETES AND PREGNANCY

By John N. Bell, M.D., F.A.C.S., Detroit, Mich.

THE subject, diabetes and pregnancy, is brought before the Association for discussion in the hope that we may arrive at some more definite conclusions regarding the prognosis and treatment.

INCIDENCE

If we are to judge from what appears in the standard textbooks on obstetrics relative to this subject, pregnancy complicating a true diabetes is a rare condition, Williams in 1909 being able to collect only 66 cases in the medical literature. It is quite conceivable, however, that many cases may have died in coma supposedly uremic, when, in reality, the condition was an unrecognized diabetic coma, since a hyperglycemia may exist with a high renal threshold and no glycosuria. Most textbooks dispose of this subject by stating that it is a very grave complication of pregnancy and give a gruesome picture with a maternal mortality of approximately 30 per cent and a fetal mortality of 50 per cent or higher.

The writer believes these figures, with our present understanding and treatment of this condition, must be materially modified, as these percentages were based on the old time treatment of diabetes when no blood chemistry tests were made. It is my purpose to discuss more especially the true diabetes of pregnancy or, perhaps, it might be better to say pregnancy complicating a true diabetes, and to cite two cases occurring in my practice recently in which the outcome illustrates quite clearly the importance of the modern treatment of true diabetes. In order to arrive at a clear understanding of what constitutes a true diabetes in a pregnant woman, a brief discussion of the different types of glycosuria may not be amiss at this time.

Lactosuria, as is well known, is a condition in which milk sugar is found in the urine and is due to resorption of milk from the breasts and its excretion by the kidneys. It can be distinguished from grape sugar by the fact that Fehling's solution can be reduced after the fermentation test has been applied.

Alimentary glycosuria is a condition sometimes called "physiologic glycosuria" where grape sugar is found in the urine especially in the latter months of pregnancy, but the characteristic symptoms of a true diabetes, such as furuncles, pruritus, thirst, etc., are absent. It is due to an excessive ingestion of starches and sweets in the diet and disappears promptly when these are withheld.

Renal diabetes is a condition where there exists: I. A fairly constant glycosuria not affected by carbohydrate intake, thus distinguishing it from alimentary glycosuria. II. Absence of symptoms of diabetes. III. A *normal* blood-sugar content. In these cases glycosuria is more or less constant in each pregnancy, but the sugar disappears promptly from the urine after delivery.

Diabetes mellitus is differentiated from the other types of glycosuria in that a hyperglycemia is present together with the characteristic symptoms of true diabetes—thirst, pruritus, etc., thus distinguishing it from the so-called renal diabetes.

Obviously, therefore, when confronted with a glycosuria in a pregnant woman our first concern should be to determine whether or not we are dealing with a hyperglycemia. This may be done by a careful inquiry into the patient's family and personal history, applying the regular tests for the milder forms of glycosuria and a careful blood-sugar estimation, in order to determine if the renal threshold has been passed and sugar is being poured out in the urine.

If it is found that we have one of the milder forms of glycosuria to deal with, we may rest assured the case will terminate favorably with the ordinary attention to diet, and, in the renal type, an occasional blood ratio test. Should, however, the case prove to be one of hyperglycemia, the question then arises: Shall we terminate the gestation or attempt to carry the patient to term by instituting the Allen-Joslin treatment or some modification?

I desire to report the two following personal cases, of which the first illustrates a decidedly happy outcome for both mother and child; while in the second, death of the child occurred *in utero* at term.

CASE 1.—Was that of a young woman, age twenty-six, primipara, weighing 140 pounds, apparently in perfect health, five months pregnant, personal history negative, except for childhood diseases. About the sixth month of her gestation she developed a glycosuria. On careful inquiry it was found that her father was a diabetic and that the patient had shown a trace of sugar in her urine when about seventeen years of age. This, however, had disappeared and she was in excellent health up to the time of her marriage. The glycosuria did not respond readily to the withholding of the carbohydrates and she was placed in the hospital under the care of a competent internist.

Unfortunately the blood-sugar ratio was not determined until she had been three days in the hospital. It was then .165 per cent. Following three days' starvation treatment the glycosuria dropped from a 4+ to 1+ and on the twelfth day the blood sugar was .12 per cent. After about three weeks green vegetable and fat treatment with an occasional allowance of oatmeal, she reached a tolerance of 1333 calories and was allowed to go home, but was requested to report daily the condition of her urine and to adhere rigidly to the modified diet. She entered the hospital again at term feeling perfectly well, with a trace of sugar in the urine and a 2+ albumin. Blood sugar .15 per cent. Labor was induced by the administration of 1½ ounces of castor oil. She was delivered under gas-oxygen anesthesia, low forceps and mediolateral episiotomy. At no time after delivery did she show any signs

CHART OF CASE 1.

DATE	URINALYSIS						BLOOD CHEMISTRY						DIET			
	C.C. VOL.	SP.GR.	REACT.	ALB.	SUGAR	GR. NH_3	SUGAR	N.C.N.	URIC	FAT	WGT.	B.P.	CARB.	PROT.	FAT	CALOR
1- 8-21		1018	Alk.	Tr.	****							124/76	House diet			
1- 9-21		1020	Ampho	–	***						142		Starvation			
1-10-21		1020	Acid	–	**	.25							Starvation			
1-11-21		1018	Acid	–	*		.165	25	4.3	.857	138¼		5%	23	18	285
1-12-21		1019	Acid	–	*(–)	.46							10.5	31.5	29	420
1-16-21	1200	1017	Acid	–	*						140¼		72.5	57	29	775
1-17-21	1140	1020	Acid	–	**	.32							72.5	57	29	775
1-21-21	1560	1019	Acid	–	*	.44	.12	20					72.5	57	29	775
1-23-21	1140	1018	Acid	–	*	.46					139¾		64	50.5	52	915
1-27-21	1860	1020	Acid	–	**								70	60	70	1133
1-29-21	2220	1016	Acid	–	**								70	69.5	80	1260
1-30-21	2460	1013	Acid	–	**	.24					138¼		65	70	90	1333
2- 1-21	1890	1014	Acid	–	–								65	70	90	1333
2- 2-21	1900	1014	Acid	–	–								65	70	90	1333
							Return to Hospital									
4-20-21								20				120/87	77	38	24	674
4-22-21	360	1012	Acid	**	*		.15	Day following delivery					64	26	20	540
4-27-21		1020		**	Trace		.15	21		.70		140/90	74	58	73	1183
5- 1-21	1024	1020	Acid	–	–								66	45	96	1330
5- 4-21	1728	1020	Acid	–	Trace	.38							74	53	102	1420
5- 6-21	1696	1020	Acid	–	Trace	.21			Home				89	74	92	1615

Delivery—Gas Oxygen—Low Forceps—Medio-lateral episiotomy. Baby's urine neg. for sugar.

of coma and both mother and child made a normal recovery, except that the mother has a persistent mucoid vaginal discharge which resists all treatment. The urine (5 months after delivery) is free from sugar and she has lost about 10 pounds in weight. At birth, the baby's blood and urine were negative for sugar and now, at five months, she is a perfectly normal child. It seems fair to presume this to be a case of pregnancy complicating a mild diabetes mellitus. This patient had shown grape sugar in the urine prior to her marriage and there may have been an inherited tendency toward diabetes; her father being a true diabetic for many years.

The favorable outcome in this case, I am inclined to believe, was due to careful supervision and modern treatment. The case is reported with the hope that obstetricians may be led to take a more optimistic view of this complication of pregnancy and report their experiences, so that in the future we may be able to have sufficient data on which to base a more definite and encouraging prognosis. It will be noted on referring to the accompanying chart that the urine sugar was + when the blood sugar was .165 and did not decrease when the blood sugar was .12, thus suggesting a low renal threshold.

CASE 2.—Is quite another picture. A primipara, age thirty-seven, weighing 180 pounds, of full habit, consulted me in her eighth month of gestation; she gave a negative history, except for childhood diseases. Urine free from sugar and albumin up to within three weeks of term, at which time she developed a trace of sugar. Supposing it to be an alimentary glycosuria, I placed her on a restricted diet, eliminating the carbohydrates. She responded promptly, and the next specimen of urine was free from sugar. She remained on the restricted diet, but one week before term the sugar reappeared in the urine. A blood sugar estimation was now made and it was found she had a mild hyperglycemia, 138 mg. to the 100 c.c. Her urine at this time showed .432 per cent sugar. Patient felt perfectly well; the child was living and active. She reported again at term, feeling in the best of spirits, but on auscultation and palpation it was found the child was dead *in utero*. Labor was induced with Voorhees' bag, the patient making an uninterrupted recovery. The urine still shows a marked trace of sugar. On more careful inquiry into her history before marriage it was found that she had, at times, been troubled with a vulvar pruritus and thirst; but she had never consulted a physician.

This case, I believe to have been one of a long standing mild hyperglycemia with a high renal threshold as it was an easy matter to render the urine free from sugar by simply withholding the carbohydrates, and a more favorable outcome might have resulted had the true condition been determined and proper treatment instituted earlier in her pregnancy.

In conclusion permit me to suggest: 1. That a more careful prenatal history be taken in all obstetric patients. 2. That a blood-sugar estimation be made in all cases in which symptoms of diabetes are present regardless of the presence or absence of glycosuria. 3. That a fair trial of the newer forms of treatment of diabetes be instituted before terminating the pregnancy.

The writer is indebted and deeply grateful to Dr. O. C. Foster, Chief Resident in Obstetrics, Harper Hospital, for valuable assistance in the preparation of this paper.

DISCUSSION

DR. IRVING W. POTTER, BUFFALO, N. Y.—I can report four cases of pregnancy occurring in diabetic women. The first was a woman who had undergone reverses and while three months' pregnant went into a state of coma, following a

long period of mental and physical exertion. She was brought to me by a physician, and I refused to terminate the pregnancy. Possibly if I had she might have been alive. Another case came from Toronto, a distinct type who went into labor at full term and was delivered of a dead baby. She went on to recovery but still has her diabetes. Another case was a true diabetic, with a brother who was diabetic and was treated for years for the disease. She also lost her baby. The fourth case was the daughter of one of our most prominent families whose father was a diabetic, and an uncle who was a diabetic has since died of the disease, but she was carried along through the entire pregnancy, and was delivered by myself of a perfectly healthy baby at full term. She, however, shows a considerable amount of sugar in the urine and is very rarely sugar free.

DR. M. A. TATE, CINCINNATI, OHIO.—Some ten years ago I presented to this Association a paper on glycosuria complicating pregnancy. One of the two greatest advances in obstetrics, as brought out by Dr. Bell, is prenatal care. Every pregnant woman when she consults a physician should receive a most careful examination, particularly of the urine. If we have a case of true diabetes, the patient having suffered for a number of years, that patient should not, in my opinion, be allowed to go on to full term. If we have a temporary glycosuria that patient can be carried through by appropriate treatment.

DR. BELL (closing).—It seems to me it is a question of just how long before term we should believe a patient could be carried to term with modern treatment. I had hoped that some of the members would discuss that point. For instance, a patient presents herself, as in my case, four or five months before term: will you, knowing she has a true diabetes, attempt to carry her to term or will you not? This case, of course, may have been an exception and had a very fortunate outcome, but I believe we should make some effort to carry these women to term in the hope that they will come through all right.

HEART DISEASE IN PREGNANCY

By W. G. Dice, M.D., F.A.C.S., Toledo, Ohio

JUST as the examination of thousands of men for the army revealed, as never before, the presence of heart murmurs that did not mean organic disease of the heart, so the careful examination of women during pregnancy shows that many women have or are developing murmurs which are not dependent on heart lesions.

There are certain changes that take place within the heart and circulation during pregnancy which are familiar to all: In the early months, the quickening of the pulse; by the sixth month, the shortness of breath on exertion; and by the seventh or eighth month, the encroachment of the enlarging uterus upon the diaphragm alters the shape of the chest, broadens it out at the lower rib edge, and with the widening of the chest circumference, the heart is displaced upwards, frequently to an inch beyond the nipple line, and the apex is pushed up to the fourth interspace. At this period, also, the pressure of the heavy uterus sometimes gives rise to more or less extensive edema and varicosities of the legs. Formerly we were taught that the heart hypertrophied during pregnancy; but more careful observations and study with x-rays disprove this. With all these changes there arise physiologic or functional murmurs in 40 per cent of pregnant women; and, unless properly interpreted, they may lead to undue anxiety on the part of the physician and, consequently, unwise advice to the patient. No cardiac irregularity or murmur is, of itself, an evidence of heart disease.

Newell states that valvular lesions, the result of chronic endocarditis, can be demonstrated in from 1.5 to 2.5 per cent of all pregnant women, the percentage varying according to the interpretation put upon the presence of murmurs.

The mortality from the various heart lesions differs greatly: Mitral stenosis gives the highest mortality, 50 per cent; uncompensated aortic disease, which is rare in pregnancy, 25 per cent; while mitral regurgitation, with no previous break in compensation, shows an almost negligible mortality under proper care in young and vigorous patients. However, the actual mortality does not tell the whole story in these cases with true organic lesions; for, whereas the patient may survive the pregnancy and labor, the extra strain thrown upon the heart during gestation, is often the beginning of years of invalidism, or the heart is left so crippled that the patient succumbs to later intercurrent disease from which she otherwise might have recovered.

An acute endocarditis arises rarely in pregnancy as the result of

some septic process, such as acute articular rheumatism, influenza, tonsillitis, or other infectious disease; but when it does occur, it is always a serious complication; occurring late in pregnancy it may prove fatal; or, if it happens early, will lead to an abortion. Late in pregnancy, as a result of toxemia, an acute dilatation of the right heart may take place, where in addition to the increased blood pressure and albuminuria, there are added edema of the lungs, cyanosis, and valvular murmurs.

In a recent case, seen in consultation, this condition occurred and the patient, at the time, was *in extremis.* She weighed 230 pounds, had a blood pressure of 160, pulse was irregular and rapid; she was unable to lie down for the previous two weeks; she was cyanosed and gasping for breath. A cesarean section was quickly performed under gas and oxygen, with the patient in a semireclining position. A living child was delivered. The mother was in a critical condition for several weeks, but ultimately made a good recovery. She now does her usual work and no murmur can be heard.

More frequently there come to us patients with a history of a heart murmur, or some form of heart trouble, the result of a previous infection. Every one of these cases requires the most painstaking examination, along lines that will later be explained, to determine the efficiency of the heart and the actual condition present. In taking the history of every obstetrical patient, careful inquiry should be made as to any past infection which may have damaged the heart valves or muscle, and yet show no symptoms during ordinary life, but which might give rise to symptoms later under the burden of pregnancy and labor. Pregnancy imposes more work on the heart in maintaining the placental and the general circulation against the increased intraabdominal pressure and the augmented body weight (20 to 50 pounds), which the ordinary patient puts on during gestation. It is this which reveals the myocardial inefficiency during the later months of pregnancy.

Patients with a history of heart murmur or cardiac disease, come to consult us, occasionally, as to the advisability of marriage and childbearing; but more frequently they come after marriage, already pregnant, and with a history of previous heart trouble. Even when they have consulted a physician as to childbearing, they are often ill advised; the physician making only a cursory examination, not appreciating all the dangers ahead in certain lesions. A case, now under observation, came after the fourth month of pregnancy with beginning decompensation from mitral stenosis; yet, she had been advised that she might have two or three children if she so desired.

One should remember that a sound heart may have a murmur; it may be physiologic or functional and, therefore, innocent; but

it is important for the patient's peace of mind, as well as our own, that we carefully differentiate the harmless from the dangerous murmurs. The significance of a murmur is based on the functional efficiency of the heart and on the presence or absence of other symptoms of cardiac disturbance. Detection of a mitral systolic murmur or any other murmur, a mitral being the most frequent, should cause us to consider carefully the pulse rate, its rhythm, and the size of the heart; if the response of the heart to effort is good and the size of the heart is not increased, then the murmur is of no significance; and if the heart is enlarged and there is good response to effort, then pregnancy may be allowed. If the heart is hypertrophied and the response to effort is limited, pregnancy requires most careful watching. If there is any question in regard to the advice that should be given, a competent heart specialist should be consulted.

Physiological heart murmurs, according to MacKenzie, are always systolic in time, and it is impossible to tell the origin of most of them; they may be louder at the apex, base, or midsternum, and may vary with respiration or posture; sometimes they are heard when lying down and disappear when rising, or *vice versa.* As a rule functional murmurs are systolic in time and are heard with equal clearness over different parts of the heart. The murmur is usually soft and blowing; there is no accentuation of the second pulmonic sound; they may increase or decrease during pregnancy, or may come and go.

A rough murmur, especially if accompanied by a purring tremor or a musical note, is indicative of a valve lesion; the transmission of the murmur is important; in actual organic murmurs, the smaller the leak, the louder the murmur. Bearing all these things in mind, the physician, in advising a cardiopath as to marriage and childbearing, should make certain that the heart is defective and should then endeavor to determine the efficiency of the heart. Every case of heart disease should be painstakingly studied and treated on its own merits.

Burckhardt and others have called attention to the importance of a continuously low blood pressure, or pulse pressure, as a symptom of an inefficient heart muscle; a muscle that is able to meet the demands of ordinary life, may give way under the strain of labor.

Webster has said that it is a safe generalization that a woman with a chronic cardiac lesion, i.e., valvular or myocardial degeneration has, *ceteris paribus,* a shorter life expectancy if she becomes pregnant than if she does not, and the risk increases with successive pregnancies. One sees, occasionally, a patient with a definite organic heart lesion go through one, or several, pregnancies with no more discomfort than the average patient.

Heart failure is a question of myocardial efficiency. The force of the heart is of two kinds, rest and reserve force. The former is the

force of the heart when the individual is at rest; the reserve force is called into play when effort is made. Heart failure begins by a diminution of the reserve force, and shows itself by a limitation of the power of the heart to respond to effort. The first sign of heart failure is the patient's consciousness that efforts, formerly made with ease and comfort, now cause distress. As has been said above, during pregnancy a healthy heart may show such a symptom from the burden of pregnancy, the encroachment of the uterus upon the diaphragm, the increased body weight, etc.; but, usually, there is not much danger, unless there is some previously unrecognized myocarditis. But this symptom, when due to heart failure, does not subside as quickly as when the heart is normal.

In beginning heart failure from organic disease the patient is apt to notice first, as MacKenzie puts it, "breathlessness with its associated phenomena in consequence of the stimulation of the respiratory reflex, and she complains next of pain and its associated phenomena in consequence of exhaustion of the heart muscle." The breathlessness is due to the failure of the heart to supply sufficient blood to the respiratory center, while the pain is due to the insufficient blood supply to the heart muscle.

Any woman who has suffered from these two symptoms during ordinary life should be advised against childbearing; or, if pregnant, it is advisable to empty the uterus early in most instances, otherwise she will more than likely abort, and her heart will be left in still worse condition; or, if allowed to go on, and decompensation occurs, she is apt to lose her life.

If a patient with definite heart lesion has never had failure of compensation, and if her age is such that she is apt to have good recuperative powers in the event of possible decompensation, and if the lesion is a mitral regurgitation and not a stenosis, she may be permitted to become pregnant, or, if pregnant, may be allowed to continue; but she should be told the whole story of the importance of taking care of herself and of keeping under careful supervision, not only throughout the pregnancy, but for some time thereafter. Therefore, the valvular lesions of themselves do not constitute a bar to pregnancy, but rather the manner in which the circulation is and has been maintained.

Every patient with a history of cardiac trouble should be most painstakingly examined before and after exercise; she should also be examined in the morning after a night's rest before rising, so as to determine whether there are signs of passive congestion at the base of the lung on the side upon which she has been lying. If there are some subcrepitant râles audible in this region, and these râles disappear after one or two deep inspirations, they are of no significance;

but if the râles persist, and there is a change in the percussion note of that side, it is an evidence of inefficient heart muscle, and pregnancy should be forbidden, or, if present, it should be interrupted. Many heart cases will do fairly well until the sixth or seventh month of pregnancy; then, when digestive disturbances and abdominal distention give rise to pressure, or toxic symptoms set in, the heart is embarrassed.

Other factors also enter into the question of allowing pregnancy, or the continuation of a pregnancy, in these cases. As intimated above, the valve involved and the condition of the heart muscle are of importance; also the patient's general health, habits, and social status must be considered in determining the course to be pursued.

If the patient is poor and unable to have sufficient help with her work, or if she has other children to care for, the strain of pregnancy will be greater than if she is able to enjoy ease and comfort. One of the greatest difficulties with which the physician has to contend, is to make cardiopaths realize that they are cripples, more so than if they were minus a leg and compelled to use a crutch or cane. Because the symptoms are more or less subjective, they do not appreciate that they come from overtaxing the heart, and so are rebellious at the restrictions we put on their efforts.

During pregnancy a cardiopath requires more careful watching than a normal case, for the patient is more prone to toxemia and the digestive functions are more easily disturbed; she requires plenty of fresh air, a restricted diet, and most careful supervision of bodily exercise, so that she may not overtax her heart. One must be ever on the alert, especially in the later months of pregnancy, for the first symptoms of impending heart failure. If inefficiency of the heart muscle is evident, the patient should at once be put to bed and every effort made to restore the circulation. If the pulse rate is much increased digitalis in sufficient dosage to slow the pulse should be given. In auricular fibrillation the best results are obtained from digitalis, for here the heart failure is associated with rapid pulse rate, and many of the beats are inefficient.

While digitalis slows the heart, the individual beats are stronger and more effective. One should give sufficient dosage to obtain results. In a recent case one dose of 60 minims was given, followed by 30 minims every three hours until the pulse fell to 80, and was then stopped on account of nausea, to be resumed as soon as possible in smaller doses. Usually, one needs to give only 15 to 20 minims every three or four hours, for from four to seven days, to bring the pulse down to 60 or 70 per minute. Symptoms of overdose of digitalis are nausea, vomiting, and diarrhea, with a feeling of tightness across the chest and a drop in the pulse rate. Patients should avoid everything

that might throw a strain on the heart, like mental worry, straining at stool, digestive disturbances, etc. They should also have small frequent meals, and mild hypnotics for sleep, if needed.

The course for further action, must depend on the period of pregnancy and whether there is a history of past broken compensation. If early in pregnancy, as soon as compensation has been reestablished the uterus should be emptied, unless the heart responds promptly to treatment. If the patient realizes the risk of continuing the pregnancy and can take the best of care of herself, and is willing to take the chance, then pregnancy may be allowed to continue, though frequently the child is lost anyhow through prematurity. If there is a history of previous decompensation, the outlook for going through the pregnancy safely is bad. If the lesion is a mitral stenosis or a chronic myocarditis, the chances of the heart bearing the strain of the later months of pregnancy and labor is small. In mitral stenosis the termination of pregnancy is indicated when edema of the lungs persists in spite of sitting up in bed, or if the pulse remains over 100 with palpitation on effort.

As stated above, mitral stenosis is the most serious heart lesion; it is usually due to rheumatic endocarditis, and is not often noticed during the acute stage of the illness, because the stenosis does not begin until cicatrization has narrowed the orifice, and because the lesion is progressive.

If in any heart lesion decompensation occurs late in pregnancy, and if, by careful treatment and nursing, there is hope of securing a viable child, pregnancy may be allowed to continue; but as soon as labor begins, everything must be done to reduce muscular strain. The treatment to be adopted will depend upon whether the patient is a primipara or a multipara, the condition of cervix and perineum, and the size of the child. If she be a primipara, a cesarean section will prove the best procedure. When heart failure is so pronounced as to threaten life, immediate intervention is necessary. If premature labor does not set in, and even this is dangerous, a prompt hysterotomy will often save the life of both mother and child. In these extreme cases the heart failure is shown by the dropsy, enlarged liver, edema at the base of the lungs, and cyanosis. Each day the pregnancy continues is fraught with danger. The patient's condition is desperate whether the pregnancy continues or not.

Ether is not a safe anesthetic. One should choose between gas and oxygen or a local anesthetic, as advocated by Webster. In any case in which a cesarean is done, sterilization should be performed to prevent subsequent pregnancy. In a case with a definite heart lesion, without broken compensation, one must realize that labor may bring on heart failure, and labor must be so conducted as to save the heart

in every way. Morphine and scopolamine should be given during the first stage to quiet the patient and assist in dilatation of the os. As soon as the cervix is dilated or dilatable, a version should be performed, or the forceps applied, to shorten the second stage.

Death of the mother may occur after the delivery of the child, or during or after the third stage of labor, from the change in the intra-abdominal pressure and consequent overdistention of the right heart. To forestall this, some have advised the gradual removal of the placenta, thus allowing a rather free loss of blood. Unless the loss of blood is too free, one should avoid the use of pituitrin and ergot. The use of sandbags weighing from 25 to 50 pounds has been advocated in order to maintain the intraabdominal pressure; but, at all events, a tight abdominal binder and compress should be applied and the patient most carefully watched after she is returned to bed.

During the puerperium prolonged rest in bed, with appropriate medication, is indicated. The patient's activities for weeks must be carefully supervised. The question of nursing the child will be determined by the patient's general condition, especially the condition of the heart and her natural recuperative powers. Patients who have gone through with no break in compensation are usually able to nurse, while those who have had decompensation will be better off when relieved of this added strain.

CONCLUSIONS

During pregnancy no cardiac murmur or irregularity is of itself an evidence of heart disease.

Pregnancy lessens the life expectancy of any woman with a chronic valvular or muscular lesion.

Valvular lesions of themselves do not constitute a bar to pregnancy; but the manner in which the heart does its work is all important.

Every cardiopath is a cripple, and her treatment throughout pregnancy and labor must be such as to spare the heart in every way.

Cesarean section gives the best results in uncompensated cases and in those cases where heart failure threatens during labor.

DISCUSSION

DR. JOHN OSBORN POLAK, BROOKLYN, N. Y.—In the discussion of this excellent paper I wish to emphasize a few points.

First, the importance of prenatal care. In following some 5,000 cases in our prenatal clinic we found that 2 per cent presented heart lesions. In other words, there were 100 cases that had definite heart lesions. I do not believe that the internist has an appreciation of the surgical heart or the obstetric heart. It is the man who is following the case from day to day and from week to week in his prenatal work who is the best judge of the woman's cardiac force. It is not a murmur, as the Doctor has said, but the muscular force and action that must be considered in determining whether this woman is capable of going on with her pregnancy or whether it must be terminated. It is interesting that in these 100 cases there

were only five that needed interference. Three had cesarean sections and two, after rest in bed with no improvement, were delivered in the early months by abdominal section, with sterilization.

We believe that section is the preferable way to empty these uteri and that these patients stand operative procedure better than they do induction of abortion, as the nervous element in all these cases is very marked. In other words, by anociassociation and plenty of morphine, scopolamin and gas, one can deliver these women at three or four months by abdominal hysterotomy, sterilize them and have better results than he can by producing abortion. That may seem odd, but it is a proved fact.

Another point is that repeated pregnancies jeopardize the patient's life and her longevity. We therefore feel that where we are able to carry a woman to term and she does not spontaneously deliver, and spontaneous labor relieved with the free use of scopolamin and morphine, supplemented with low forceps in the second stage is our choice, a cesarean section with sterilization is the safest procedure.

The next point of importance is the management in the third stage. These patients will often go through the first part of the labor and collapse in the third stage. This, I think, can be prevented by: First, use of abdominal pressure in the form of heavy sandbags; second, bleeding to relieve the right heart, and third, vigorous stimulation at that time.

Finally, these heart patients do not need as much digitalis as the internist usually thinks. They do better with rest and small doses of morphine than they do with heroic treatment.

THE BREAST PHYSIOLOGICALLY AND PATHOLOGICALLY CONSIDERED WITH RELATION TO BLEEDING FROM THE NIPPLE

By Gordon K. Dickinson, M.D., F.A.C.S., Jersey City, N. J.

THE breast is the most restless and susceptible of organs, being influenced by hormones, toxins and the psyche, intended by Nature to functionate in a cycle as a secondary sexual organ. It is composed of converted dermal basal cells, supported by a soft hyaline connective tissue.[1]

Hyperemia is induced monthly by the ovarian secretion, and, if pregnancy ensues, the hormones, sent out from the placenta, activate the gland to further growth[2] and the formation of colostrum, which has, according to Robertson,[3] the same effect when reabsorbed as the secretion of the hypophysis, determining the time of labor. With weaning, the breast returns to a quiescent state, but not as before.

It might be said that the breast yearns for normal function, that every bosom will tend to pathologic states of the tumor type, as will also the uterus and ovary, if the natural cycle be interfered with. If, perchance, abortion occurs, particularly the self-induced, the tissues of the breast are shocked, and a woman who has suffered repeated abortions has a breast more prone to the formation of tumors with malignant tendencies, for she who suppresses or defies Nature is penalized.[4]

In certain people suppression of the menstrual flow may produce an active congestion of the breasts with pain, tenderness, and sometimes bleeding. In my early practice I can recollect a woman, well nourished, and not of the neurotic type, whose flow was suppressed for some unknown reason. Her bosoms were large, overhanging, and there was excoriation of the skin underneath. At the time she should menstruate there would be an oozing of blood from this excoriation and, occasionally, a discharge of blood from the nipple. After a year or so the menses were reestablished and the phenomenon ceased. This case was in the dim past when notes were not taken, but the mental recollection is, I think, accurate. Literature ascribes to dysmenorrhea the same condition of bleeding, which we believe to be a fiction.

It is recorded that there is also a response in conditions of metritis, parametritis, and ovarian tumors. Lane[5] claims that the breast, particularly the upper outer lobe, will harden when there is present what he calls "fecal blood." Lockwood[6] has had a similar condition in a

case of infective vaginitis and another in cholecystitis, the hyperplastic process in the bosom disappearing with relief of these conditions.

The instability of the breast is also seen as the woman ages, the breast of puberty passing over to the full-formed condition of adolescent life, then with menopause there is recession, more or less complete, with increased tendency towards pathologic changes. With the psychic states of love and its expressions in prolonged courtship, the breast often responds with alteration in its tissue substance. So we see that this organ responds, normally and abnormally, to diverse conditions with a low margin of normality.

Before thirty-five years of age the most common tumor found in the breast is the fibroid, which is an overgrowth of the hyaline connective tissue, discreet, movable under the skin and, occasionally, accompanied by slight but sharp pain. It is considered benign. We have had one case in which its irritation was sufficient to produce a bloody discharge from the nipple. These fibromas sometimes seem to be neuropathic, for we have known them to disappear when the exciting cause, psychopathic or otherwise, passed away. They then soften and become a natural part of the bosom.

After thirty-five years of age, the fibrous tissue grows into and includes areas of the breast substance. These tumors are in the periphery, often slightly tender, occasionally associated with pain, and if they remain benign, they are not apt to grow. In a somewhat larger percentage of cases than the fibroid, irritation and hyperemia are sufficient to produce a blood-stained discharge. We have had several instances of this.

Occasionally the lining of the ducts will proliferate and form papillomas. They are always well supplied with blood and the normal movements of the breast will rub off the surface and produce hemorrhage. This type of growth is the most common cause of bleeding from the nipple. It is to the duct what warts are to the skin, and may exist for many years, bleeding without becoming malignant. According to Bloodgood,[7] it would be inferred that the tendency to malignancy is slight enough not to be seriously considered, while Rodman[8] claims the dangers of malignant changes are great. We have had a number of cases of this type, and, in the majority of them, the microscope has shown that the cells at the base had begun to wander and other evidences of malignancy were demonstrable.

Sometimes the ducts will become occluded by constriction and distended with a clear serous fluid. It is often difficult to differentiate between a cyst and a fibroadenoma. Tapping will establish a diagnosis. These cysts are prone, however, to have small papillomas on the surface which, not being rubbed or irritated, are not given to

hemorrhages. They possess the same tendency to malignancy as the first-mentioned type, which occurs nearer the nipple.

It is now believed by pathologists that tumor formation in the mammae is a type of chronic inflammation. We know that the breast excretes germs from the blood and also that germs can pass up through the ducts of the nipple and into the tissues of the breast. We have referred to the findings of Lockwood, where vaginitis and cholecystitis were associated with temporary hyperplasia of the mammary substances. Lane's investigations also tend to confirm this.

Curiously, the upper outer lobe, the left one in particular, is the portion more apt to be hardened and multicystic and the site of chronic interstitial change which, eventually, passes through the bosom and is known as chronic cystic mastitis. Why this particular lobe should be selected cannot be explained on embryonal or histologic grounds; but it seems to us possible that there is some correlation with the long-lost axillary breast, which comparative anatomy shows once existed, and which we now find occasionally as an anomaly; that the forces which led to the disappearance of this gland are acting upon the lobe which extended out toward it. This may be an idle opinion of the writer, nevertheless, it is the portion of the breast first affected. If we can discover and eliminate the cause, we may have recovery; if not, we have tissue changes where the basal cells are prone to go wild, lose their centresomes, undergo active mytosis irregularly, and escape through the poorly resisting hyaline connective tissue and develop carcinoma. Applegate[9] claims carcinoma is preceded by abnormal involution.

The wandering cell acts very much as a parasite, producing local inflammatory reaction, with formation of fibrous tissue. If the glandular substance be in excess, we have a soft cancer; if the fibrous, the scirrhus type, both equally malignant. We have noted hemorrhages from the nipple in both soft and hard types, but the blood is always mixed with serum so that the discharge is more sanious than bloody.

We feel that gratitude should be extended to the pathologists for the work done in the study of the breast; but, like all specialists, from a clinical viewpoint they have exceeded themselves in nomenclature, obscuring the clinical condition by the various names given to each pathologic stage. Not until Warren,[10] in 1905, simplified the classification of tumors was the clinician and the average surgeon able to grasp the subject intelligently. The register of the American College of Surgeons includes the names of several thousands of this cult, and we fear some may not think in terms of pathology; therefore, if we are to fight cancer and comprehend so-called precancerous conditions or, better stated, conditions which often develop into or are followed

by carcinoma, we should give to those who operate a ready means for diagnosis by simplifying terminology.

Every surgeon hesitates to mutilate a woman, and particularly this organ, but every surgeon with a conscience will attack that which is or may become cancer. Benign means "born good," but all tumors of the breast, which have this title, are apt to go bad and are not to be trusted. As to their innocence there is no reliable sign or symptom. Bleeding from the nipple we see associated with them all at times, as well as with functional conditions, and we cannot always tell by naked eye appearances what we may find after removal. Sad experience has taught us to be prompt and thorough in operation.

Neither is there a reliable sign as to malignancy or beginning malignancy. The benign condition is apt to be but temporary. We see that blood coming from the nipple is neither diagnostic nor prognostic. We know from experience that the touch cannot differentiate between adenoma and beginning carcinoma. For frank malignancy Dr. Willy Meyer, in 1894, gave us a technic which has satisfied the time test; but for tumors only "born good," we have not as yet a definite plan of attack. Some surgeons resect in part; some do a complete plastic subcutaneous resection, and others a radical removal. Can we today say who does wisely?

REFERENCES

(1) *McCarthy*: Mayo's Clinics, 1915. (2) *Schaefer*: Endocrine Organs, 1916. (3) *Robertson*: Principles of Bio-Chemistry, 1920. (4) *Bryant*: Cyclopedia of Obstetrics and Gynecology, ix, 1887. (5) *Lane*: Personal Communication. (6) *Lockwood*: Diseases of the Breast, 1913. (7) Jour. Am. Med. Assn., Dec., 1913. (8) *Rodman*: Diseases of the Breast, 1908. (9) Sajou's Encyclopedia, 1921. (10) Jour Am. Med. Assn., July, 1905.

DISCUSSION

DR. JAMES E. DAVIS, DETROIT, MICHIGAN.—This paper calls our attention rather directly to the etiology of cancer. It should be remembered that this gland is decidual. Its period of functioning is an active one and it is constantly subject to traumatism: therefore: inflammatory lesions very commonly develop. The connection between the functioning of the organs of gestation and the breast has been made clear in my paper. Vicarious menstruation often occurs during periods of suppression, or at least the breast is liable to show congestion, if not actual bleeding. The blood vessels about the nipple, many of them, have very thin walls, and if subjected to an active congestion it is easy to see how rupture can take place.

The cell normally has three stages to pass through: The developmental stage, the stage of maturity and the stage of senescence, and under congestion the period of development is gradually increased by the nutrition brought to the part. The growth impulse is intensified, but without adequate differentiation of cells and tissues. These cells do not all mature and the cell passes through the developmental stage directly into senescence.

In normal tissues or those with ability to return to a status of essentially normal function, a certain number of cells always fail to reach maturity. In tissues of decidual and vestigial character and in tissues undergoing the vicissitudes of inflammatory change, the number of immature cells is greatly increased. In cancer there

are but few cells that reach maturity. Their number is never large enough to differentiate a tissue capable of more than very incomplete function.

DR. ROLAND E. SKEEL, LOS ANGELES, CAL.—Dr. Dickinson's paper is rather difficult to discuss in a few moments, largely because of the great number of subjects he has covered, but there are two things of which I wish to speak.

First, I wish Dr. Dickinson in closing, to say a little more about the psychic origin of any tumor. Some of us, I think, would find difficulty in subscribing to the theory that any tumor had its origin in the psychic field, although many of us are willing to believe that the psychic field has been indifferently explored as yet.

The second thing was not brought out, I think, and is really very important. Dr. Dickinson mentioned the importance of early diagnosis and of early surgical treatment of any condition producing bleeding from the breast, but the important thing about the benign tumor of the breast is that so many general practitioners advise a young patient to let a benign growth alone.

Has it not been the experience of every one in the room to have patients come to the radical operation for carcinoma who have had an adenoma for many years before? They are so accustomed to the small growth that the early development of cancer means nothing to them, and how often are we startled after removing a supposed adenoma to find that the microscope shows a beginning adenocarcinoma and our minor operation is a failure instead of a success. The woman of forty or forty-five who develops a lump in the breast, will probably consult her physician without delay, but the woman who is accustomed to the presence of her little adenoma will allow several months to elapse before doing so.

DR. AARON B. MILLER, SYRACUSE, N. Y.—A patient came under my observation with a history of bleeding from the nipple with each menstrual period. I looked over the literature and found it was very unwise to allow a condition of that kind to remain, that the probability was it would become malignant, and the thing to do was to operate early. After seeing the patient several times I found she had spent considerable time in New York City and had been shopping around the country with the advice that it should be taken care of at once, otherwise, serious conditions would probably develop. She remained under my observation for some time but continued to keep her breast, despite my advice to the contrary and she has just sailed for Europe. During each menstrual period bleeding occurs and if the breast is pressed several drops are exuded. This is merely a matter of clinical experience.

DR. CHARLES W. MOOTS, TOLEDO, OHIO.—For a number of years I have been a member of the Cancer Committee of our State Association and it has been my duty to go out into the highways and byways and talk cancer. Unfortunately, we find that the general practitioner needs educating more than the public. The public will listen and this is what occurs: the women after hearing these talks take their so-called benign tumors to their family physician and he tells them if it has never hurt them to let it alone. That is universal and I wish the men of this Association would help those of us who are working along these lines to get these men to stop that sort of advice. I am sure if we are to get anywhere in cancer we must operate on these cases in the precancerous stage. At least the patient must be put under expert service to determine whether or not the growth is cancerous.

DR. WILLIAM SEAMAN BAINBRIDGE, NEW YORK CITY.—Last year I read a paper on "Benign Mammary Tumors and Intestinal Toxemia" before this Association, and also one on "The Human Breast—A Plea for Well Directed Treatment Based on a More Accurate Diagnosis", before the Tri-State District Medical Association. The subject under discussion is so important that I feel it necessary to say a few words in emphasis of certain points.

I fully agree with the last speaker that the education is necessary not so much of the public as of the profession. I want to agree with all that has been said, but I feel it compulsory to raise a flag of caution. The layman is between Scylla and Charybdis, he has been told that every tumor is essentially malignant and should be cut out inside of forty-eight hours after its appearance. Such a statement was made before this body by one of our colleagues two years ago. Others say: "Let the tumor alone." Certainly the layman is in a difficult position. Much harm will result if there is a strict adherence to either one of these dogmas.

The examining physician must be educated to the point where he will be able to differentiate between a tumor of the breast which has become a cancer, and the "lumps" which may come from the toxemias, thyroid dyscrasia, acidosis, etc.

In my paper on "The Human Breast, etc.," I drew the following conclusions, and it may not be amiss to repeat them here:

1. The laity is coming earlier, in increasing numbers, for examination.

2. Opportunity for service, on the part of the medical profession, is being increased in proportion as the public responds to its summons.

3. The profession must develop a higher degree of diagnostic ability than in the past and possess itself of all the essential facts concerning breast conditions.

4. A judicial attitude must be maintained—careful examination with well-poised judgment.

5. Accurate diagnosis of abnormal breast conditions means and demands a careful systemic survey as well as an efficient local examination.

6. The human mamma may be the seat of changes purely inflammatory or of neoplastic nature, closely simulating malignancy.

7. The relationship between the internal genitalia and the breast has been well established. Correction of abnormal pelvic conditions may ameliorate or relieve certain mammary changes.

8. The relationship between chronic intestinal stasis and certain breast conditions seems to be proved. Toxemia from teeth, tonsils and other parts of the body may also have its effect upon the mammary gland.

9. Serious conditions are often overlooked while they are as yet amenable to the simplest measures of nonsurgical treatment.

10. The use of the terms "breast" and "mamma" as synonymous may increase the difficulties of diagnosis. The writer believes it would be helpful to confine the term "mamma" to the gland with its ducts, including its outlet, the nipple; "breast" as embracing the entire mamma with all else that surrounds it—the skin, fat, fascia, capsule, and the bed upon which the gland rests, the fascia, muscle and bone with cartilage, in juxtaposition to the mamma.

11. Any of these structures may be diseased, and multiple pathologic lesions present, rendering diagnosis more difficult.

12. Abnormal conditions, congenital or acquired, may be present in neighboring structures, and lead to wrong diagnosis of cancer, or if malignant disease is present, lead to the diagnosis of the inoperable and incurable stage although the neoplasm is early and surgically curable.

13. In spite of present knowledge, it is impossible at times to arrive at an immediate accurate diagnosis. In justice to the patient it may be necessary to keep her under careful observation, treating general conditions, before proceeding to radical surgery. If, then, mistakes occur, it should be the earnest endeavor of the profession to make them fewer and fewer.

14. It is reasonable to assume that with the early recognition of some lumpy conditions of the breast, followed by adequate systemic treatment and mechanical support, underlying factors of malignant disease may be removed.

15. A question naturally arises: If all the foregoing is true, may it not be

that in that multiplex disease grouped today under the term "cancer," there are possibly causative factors underlying malignant disease in the toxemias and the heterological activity of the endocrines? This seems to be a very promising field of research.

16. When cancer is present beyond a reasonable doubt, radical surgery is absolutely indicated.

To allow a patient to drift beyond the hope of surgical cure is a terrible tragedy; to unnecessarily and radically remove a woman's breast may be a profound calamity. With a deep sense of the limitations in the art of exact diagnosis and of the greater responsibility today in the enlarging field of service for humanity, let the profession be ever guided by the watchword, "Not Fears But Facts."

DR. DICKINSON, (Closing).—Replying to Dr. Skeel, I did not mean that the psyche made tumors, but will induce a congestion of the parts and in that way indirectly produce them.

As to Dr. Bainbridge, if you watch and wait, with all the acumen you have, you may yet be mistaken, as I was on one of my recent cases when I found that the cancer had started.

I wish to put two things on record: First, this paper was instigated by a remark of Dr. Rodman's several years ago—I respect the memory of Rodman so much that I like to mention his name. Another thing: Two years ago I developed a lump in my left breast about the size of my fingernail, psychologic, I think. (Laughter). Anyway, it came; it was tender; everything that touched it hurt it. I tolerated it for a while, then went to my local friends, who said, "Go to Deaver." I went, he examined it and told me to come back in the spring, and if it had not disappeared he would remove it. It had disappeared. It was a natural lump, without any cause apparently except that I may be unusually nervous, quick, given to emotions, and it struck me locally.

THE SLAUGHTER OF THE INNOCENTS

By Palmer Findley, M.D., Omaha, Neb.

THE medical profession would do well to consider, seriously, some of the phases of the subject of criminal abortion. We should know what constitutes a criminal abortion in contradistinction to therapeutic abortion; we should inquire as to the extent of this nefarious practice; we should ask ourselves who are the offending parties; we should know how best to protect ourselves against unjust accusation when called upon to treat these cases after they have passed from the hands of the abortionist; and, finally, we should inquire into the responsibility of the profession in view of the widespread prevalence of this social plague.

The civil law clearly recognizes the right to interrupt pregnancy before the period of viability when the life of the mother is jeopardized by the continuation of pregnancy. To interrupt pregnancy prior to the period of viability for any reason other than to safeguard the life of the mother is a moral, ethical and legal crime. Yet in spite of all civil and ecclesiastical law this heinous crime has stealthily increased from the dawn of civilization to the present time.

We are told that one in five or six pregnancies ends in abortion, and that 50 per cent of all abortions are criminal. It has been estimated that in New York City alone there are 80,000 criminal abortions annually. The practice exists in all parts of the globe and infests all grades of society. Indeed, it would appear that this social plague is more prevalent in the higher classes of society. Women of keen moral sensibilities either commit the act themselves or seek aid from others with little knowledge of the dangers involved and with conscience undisturbed. This is so because of ignorance. They know little of the pitfalls involved in the undertaking and they are possessed of the sentiment, prevalent among the laity, that there can be no life until fetal movements are felt. To illustrate how difficult it is to convince the lay public that life begins at the moment of impregnation, the eminent German naturalist, Ernest Haeckel, relates how he once made this assertion to an eminent jurist only to be laughed at. We often find women of unquestioned moral standing bitterly resenting their state of pregnancy, and who are determined to put an end to the whole affair; yet, when the date of quickening arrives and they are conscious of sheltering and nourishing a human life, their viewpoint is completely changed, and from that moment to the date of birth they live in happy expectation.

But what of the professional abortionist who, for a few paltry dollars, will destroy a potential human life and place the life and health of a mother in grave danger? The woman abortionist, who plies her trade under the guise of a midwife, the charlatan, who covertly or openly advertises in the daily press, and the physician of high or low degree, who prostitutes his profession, all alike ply their nefarious trade unabashed and unrestrained; for not one in a thousand is ever held accountable for the crimes he commits. This is largely because of the technical difficulties in getting evidence admitted in the courts; partly because of embarrassment to any individual in filing a complaint, but more than anything else, because organized medical associations have not taken definite and determined steps to rid the profession of these criminals and to educate the lay public in the dangers involved in the practice of committing abortions. Lombrosa, the great criminologist, says that "abortions in the United States have become so common that, instead of being regarded as a crime, it is a laudable and justifiable means of limiting the size of families." And Lyons says: "if concerted action be taken against these men by the profession at large the evil might easily be overcome. The most of them are arrant cowards and as soon as they realize that men of undoubted professional reputation and standing are determined that they should cease plying their nefarious calling, they will stop." Be that as it may, we must admit that the profession assumes a grave responsibility when this most universal of crimes receives from its hands little more than passive condemnation. If we are to merit the respect and confidence imposed in our profession, a determined campaign should be inaugurated by our medical organizations to the end that the ignorant may be enlightened and offenders within our ranks be brought to the bar of justice. It is futile for the profession to transfer the responsibility to our civil authorities and it is not fair to assume that it is the business of individual members of the profession to handle the situation. The civil authorities may be depended upon to do their part, and the individual member of the profession, however courageous, will find little encouragement and much embarrassment if he fights alone. The individual may be charged with ulterior motives but, when action is taken by an organized medical association of the dignity of our state and county medical societies, the affair becomes impersonal and cannot fail to impress the public and the courts with the seriousness of the charge.

Because of the grave responsibility imposed upon the induction of abortion, it is provided that one or more consulting physicians shall be employed and shall agree upon the indication for the interruption of pregnancy. This is wise not only in the interest of the patient, but for the protection of the physician on whom the responsibility rests. But what are the safeguards to be established to protect the physician

who is called to attend a woman on whom a criminal abortion has been done and who may be in a critical condition? The position of the physician in these cases is disagreeable; it is embarrassing and may prove disastrous to him if he fails to fortify himself with moral safeguards. He is charged with the double responsibility of doing all that can be done for his patient and of protecting himself against unjust accusation. He cannot afford to disregard the gossip, neither should he fail to protect himself against the real offender who would eagerly embrace the opportunity of shifting the responsibility for the misdeed. To this end, it would be a good rule, in such cases, to call a consultant for the initial examination and to witness the statement of the patient. The statement of the patient should best be in writing and should comprise a recital of her known condition prior to the abortion; when the operation was performed; where it was performed; how it was done, and by whom. If the patient is unwilling to divulge this information, then the physician would be justified in declining to assume the responsibility of the case. It is common experience that the patient will tell all she knows when made to realize her danger and a double purpose is attained—the physician in charge is protected and the guilty party is revealed.

LEGAL ASPECT OF ABORTION

By Ernest F. Oakley, Jr., Prosecuting Attorney, St. Louis, Mo.

IT IS my desire at the outset to express to your Association the appreciation I entertain in accepting the honor you conferred by inviting me to address you. My subject as assigned is "The Legal Aspect of Abortion." Much has been written and still more will be contributed by pens mightier than mine on the several phases of this subject, approaching as it does, in my opinion, more intimately into the everyday practice of the physician and surgeon than any other single element of the ethics which guide you. I say, "In my opinion," and I might add that my opinion is based on experience acquired while an assistant State's attorney assigned to the office of the Coroner of the City of St. Louis; I formed the conviction that the majority of medical men are strongly imbued with the principles of the ethics of their profession, but I was impressed, however, with their lack of practical application of the principles of ethics, due, not to their desire to thwart the administration of justice, but rather to their professional hesitancy to divulge, under any conditions, matters between themselves and their clients, which they held sacredly privileged.

There has existed the necessity of informing your profession in this regard, to the end that greater cooperation may exist between you and the law-enforcement officials. To what extent you are privileged and what is your particular duty under the circumstances of a case presenting evidence of abortion, I shall endeavor to present the legal side.

State v. Shields, 230 Mo. 9, defines abortion as the delivery or expulsion of the human fetus prematurely or before it is yet capable of sustaining life. The same case is authority that the terms "abortion" and "miscarriage" do not of themselves import a crime.

Abortion has been made a crime by statute. At common law it was generally recognized as no offense to produce an abortion on a woman with her consent and before she was quick with child. It was not even murder at common law to take the life of the child at any period of gestation, even in the act of delivery. Today the several states have enacted laws holding the commission of an abortion a felony and punishable as such. The reason is obvious. Regardless of the law and the attendant opprobrium and ruin of exposure, abortion in its unlawful sense is practiced extensively in our country. It is with regret and an expression of condolence to the great majority of your profession, that I state the abominable and nefarious practice is not confined to those outside your ranks. There are renegades among you—as indeed

exist in all circles—who for one motive or another, lend their skill to the commission of this crime.

The Statute of Missouri may be taken as a fair example of the law of the several states on the subject, and I quote and discuss Section 3239, Revised Statutes of Missouri, 1919.

"Sec. 3239. Manslaughter—producing miscarriage. Any person who, with intent to produce or promote a miscarriage or abortion, advises, gives, sells or administers to a woman (whether actually pregnant or not), or who, with such intent, procures or causes her to take, any drug, medicine or article, or uses upon her, or advises to or for her the use of, any instrument or other method or device to procure a miscarriage or abortion (unless the same is necessary to preserve her life or that of an unborn child, or if such person is not a duly licensed physician, unless the said act has been advised by a duly licensed physician to be necessary for such a purpose) shall in event of the death of said woman, or any quick child, whereof she may be pregnant, being thereby occasioned, upon conviction be adjudged guilty of manslaughter, and punished accordingly; and in case no such death ensue, such person shall be guilty of the felony of abortion, and upon conviction be punished by imprisonment in the penitentiary not less than three years nor more than five years, or by imprisonment in jail not exceeding one year or by fine not exceeding one thousand dollars, or by both such fine and imprisonment; and any practitioner of medicine or surgery, upon conviction of any such offense, as is above defined, shall be subject to have his license or authority to practice his profession as physician or surgeon in the state of Missouri revoked, by the state board of health in its discretion."

You will note that the gravamen of the offense is the intent to produce a miscarriage or abortion by administering drugs or using instruments. Also that the acts included within the statute coupled with the intent, constitute the offense. That when either the woman or quick child dies, the party responsible is chargeable with manslaughter. That when neither dies, the crime is designated "Felony of Abortion." The punishment in the former ranges from two to ten years in the penitentiary; in the latter, from three to five years in the penitentiary. In either case, the act is a crime whether the woman is pregnant or not, and in either case, the intent to produce miscarriage or abortion must be present.

The exceptions are where it can be shown beyond a reasonable doubt that the abortion was necessary to preserve the life of the expectant mother or unborn child; (a prima facie case of nonnecessity is complete by proof of the fact that the woman was in good health or her ordinary condition of health immediately prior to the abortion); or where the act has been so advised by a duly licensed physician. To this extent, is abortion as such, lawful, and would seem to be the rule generally. The moment the womb is instinct with embryo life and gestation has begun, the crime may be committed.

A Texas case in agreement with the Missouri law, holds that it is not necessary that the means employed should produce the effect desired. A physician's testimony is sufficient to show that the means

employed are capable of producing an abortion. Cave v. State, 33 Texas Crim. 335.

A New Jersey case holds in point that the intent to produce the abortion may be present without knowledge or even strong belief that the woman is pregnant. State v. Poe, 48 N. J. Law 34.

Should the woman recover, she is a competent witness against the accused. In the event of her death, her dying declaration is equally competent. In State v. Stapp, 246 Mo. 338, defendant asked for an instruction to the effect that the fact that the prosecuting witness was implicated in the alleged transaction, be taken into consideration by the jury in determining the credibility to be given her testimony. The refusal of the trial court was one of the assignments of error. The Appellate Court held this instruction should not have been given, considering such an instruction useless, containing no legal proposition, and purely a comment on the evidence.

In this connection, Bishop on Statutory Crime declares:

"An accomplice swears under the temptation of earning thereby his own immunity, while the witness does not. She discloses her own disgrace, and where no evil motive appears for it, this fact may in reason strengthen her credibility."

State v. Jones, 197 S. W. (Mo.) is authority that a woman involved in a case of this character is not an accomplice.

The Missouri law regulating the admission in evidence of dying statements, and found in Section 4034, Revised Statutes, 1919, announces the principles of the general rule.

"Sec. 4034. PROSECUTIONS FOR ABORTIONS—DYING DECLARATIONS. In prosecutions for abortion or for manslaughter occasioned by an abortion or miscarriage, or by an attempt to produce either, or attempted abortion, or for any crime of which abortion or miscarriage may be a part of the essential facts to be proven, the dying declarations of the woman whose death is charged to have been caused thereby shall be competent evidence on trial of any person charged with such crime, with like effect and under like limitations as apply to dying declarations in cases of felonious homicide: PROVIDED, that the party offering such declarations shall first satisfy the court by competent testimony that such woman was of sound mind when such declarations were made: AND PROVIDED FURTHER, that no conviction shall be based alone upon such declarations unless corroborated as to the fact that an abortion or miscarriage has taken place, and in all such prosecutions aforesaid any physician or medical practitioner who may have attended or prescribed for such woman shall be a competent witness in said cause to testify concerning any facts relevant to the issue therein, and shall not be disqualified or held incompetent by reason of his relation to such woman as an attending physician or surgeon."

A dying statement made by the deceased is competent as evidence and admissible under certain conditions.

State v. Craig, 190 Mo. 339, announcing a rule generally followed, holds it must appear that the declaration was made under a sense of impending and immediate death, and that the declarant at the time believed that she had no hope of recovery.

State v. Walter Lewis, 264 Mo. 420, follows State v. Craig, supra, holding the admissibility of the declaration is dependent upon the declarant's belief of her impending dissolution at the time it is made, and not on the length of time that intervened between its making and her death.

In the several dying statements made to me, I adopted a rule to put two questions to the declarant, in the presence usually of the nurse. "Do you know that you are about to die?" "Have you abandoned all hope of recovery?" Receiving an affirmative answer, in each instance the declaration would be taken in shorthand, immediately transcribed and read to the declarant for her approval. She would be asked if that was her statement, and if her physical condition permitted, she would sign it.

A dying declaration in proper form, supported by the autopsy physician's testimony that an abortion had been performed, and that *causa mortis* was peritonitis superinduced by the criminal operation, constitute a prima facie against the accused.

As you gentlemen well know, a statement made by deceased to one of you in your professional capacity, is not admissible as evidence in a court of law. Such a communication is held as privileged. There are well-founded reasons for the existence of this rule, and no one would wish to disturb the confidential relation which exists, and necessarily so, between the medical man and his patient.

But the physician must not consider that he is without obligation in the premises. There is incumbent on him a strong moral duty common to all good citizens—a duty to assist in the investigation and punishment of crime. When it is ascertained by the physician that an illegal operation has been performed, he should at once inform the proper authorities of his findings, to the end that a statement, competent as evidence, can be secured from the woman, and introduced at the trial of the accused, in the event she herself is not produced as a living witness.

A medical man may be a recognized expert in his own field; but when he encounters a situation that partakes of a legal nature, he is apt to seek refuge in the accepted ethics of his profession, without first considering the question and possible consequence to himself. You can readily see that this attitude may lead to grave suspicion. I have in mind the following statement of facts as an illustration.

At an inquest into the cause of death of Mrs. ———, it developed as a finding of the postmortem doctor, that an abortion had been produced. The family physician, who was in attendance on the case testified that when he was called, the woman was running a temperature, and suffering acutely from abdominal pains. On information elicited from her in private inquiry, he diagnosed the case as "probable blood-poisoning" and prescribed accordingly. The woman did not respond to treatment and died.

Asked whether or not she had told him that a criminal operation had been performed, he refused to answer. Asked whether he had determined from his own examination of her, that a criminal operation had been performed, he again refused to answer. Asked whether he had reported the case to the authorities, he replied, "Not until the woman died."

Here, you see the palpable inconsistency of the physician's position. Although he had full knowledge of the circumstances, both from the woman herself, and his examination of her, he hesitated to notify the authorities, because he feared that thereby he would be violating a professional confidence; yet, rather than certify the cause of death, actuated by the same ethics, he considered it his duty to apprise the Coroner of the case; with what results? The facts which he had in good faith suppressed were brought out and made public at the inquest; the lips of the woman sealed in death could no longer speak the name of the person criminally responsible; the verdict—"Peritonitis—resulting from abortion, at hands of parties unknown to jury."

The physician, who in his heart, despised and condemned the wrongdoer, had, in fact, protected him. Justice had not been served.

Whatever qualms or misgivings the medical man may entertain in divulging such confidences, I submit to you, they must be subordinated to his natural desire and duty to assist the State in the apprehension and prosecution of the criminal.

TREATMENT OF ABORTION

By H. Wellington Yates, M.D., F.A.C.S., and B. Connelly, M.D.,
Detroit, Mich.

THE series of abortion cases upon which this paper is based was taken from records of the gynecological division of the Receiving Hospital in Detroit, admitted from April 1st to August 15th, 1921. During these four and one-half months, we had 81 abortion patients, whose histories included 256 pregnancies, making the instance of abortion 1 to 3.1. It would seem that these figures are fairly conservative from our review of the literature.

A preponderance of cases occur during the second and first half of the third month, probably on account of the nutritional changes of the fetus, rapid development of the placenta causing marked circulatory changes, radical misplacements of the uterus, and criminal interference, which probably embraces 25 per cent.

It is interesting to note the different attitudes taken by members of the profession, together with those of our own Association, in the treatment of abortion.

The success in preventing abortion depends somewhat upon its cause. But, speaking in general, our failures have far outnumbered the successes. Abortions dependent upon diseases of malnutrition, such as tuberculosis, diabetes, or anemia, would suggest rest, feeding and proper environment, with suitable reconstructive medication. Women who show an aborting habit (stock men have this phenomenon constantly before them in animals), should be given one or two years' rest before conception is permitted. Absolute rest in bed ranging from a few days to several weeks may be necessary, together with morphine. The anodyne should be stopped at the earliest possible moment. Enemas should be used, when needed, instead of cathartics.

While lues is more often the cause of abortion in the later months, occasionally its results are seen early. I had a patient who was apparently in good health, but whose husband was Wassermann positive, who had 12 abortions, all spontaneous, before her full-time child was born. She has since had three more healthy children, but between all of them she has had numerous abortions, until they totaled 27. She was never seriously ill with any of them. She desired children, and submitted to medication and confinement to bed without complaint, for long periods of time. For the most part, her abortions occurred on the seventh week. Opiates, rest and uterine sedatives were valueless.

I am inclined to believe that, given a patient who is an early syphilitic, both she and her husband should have intensive treatment until

they are Wassermann negative in both blood and spinal fluid. We can with some hope look forward to healthy offspring, but with the old cases where the disease has become a part of their very being, pregnancy, when it does occur, should be interrupted. Treatment is of little avail.

There are times when good treatment demands emptying the uterus, as in hypertension and nephritic cases, especially when these evince their symptoms in the early months and are uninfluenced by other treatment. Then there is hyperemesis gravidarum and early incipient tuberculosis. We believe the complete operation done at one sitting is the method of choice, by either dilating and emptying the uterus or performing hysterotomy. The use of rubber bags and bougies, with the necessity of several replacements, appears to me unsurgical and dilatory, and even then, by virtue of an incomplete abortion, often requires later exploration.

When an abortion is complete, and we can be sure of it, rest in bed for seven to ten days, with a good full tray after the third day, is all that is required. There should be no mortality except as a result of hemorrhage during the abortion.

With incomplete abortion the sooner the uterus can be emptied with safety, the better. Much difference of opinion prevails on how this may best be done.

If the cervix is open, easily admitting a finger, and there is free bleeding, my procedure is to empty the uterus by means of the gloved finger under gas-oxygen anesthesia. Provided the mass cannot be thus withdrawn, a Longyear forceps is used for this purpose. We lay great stress on having these patients prepared as for cervical and perineal repair. When once the fingers, or if necessary, the whole hand is introduced, it should not be withdrawn until its purpose is achieved. At least we endeavor to manipulate as little as possible, and seek to avoid introducing anything from below. On the other hand, if there is free bleeding and the cervix closed and not easily dilatable, the patient afebrile, we pack the cervix, if possible, with a strip of iodoform gauze, and the vagina with sterile or borated gauze forced well up to the vault and allowed to remain for twenty-four hours. When withdrawn, the cervix is likely to be open, and often the products of conception are found expelled from the uterus. We freely confess, however, our inability to say whether this uterus is free from all products of conception, and feel more satisfied in our own minds when the index finger is the judge. Signs of infection, as manifested by chill, fever and sweating, are not the only symptoms that indicate trouble. Deciduitis, endometritis, and low grade infections with their consequences, are the results of retained products of conception, and our surgical sense tells us they should be removed.

When it becomes necessary to use instrumental means for dilatation, the Hegar sounds or graduated dilators are the best, especially in the presence of sepsis. They dilate equably and without trauma. This cannot be said of the Goodale type of instrument.

Barring criminal abortion, neglected incomplete abortion is the most potent factor in sepsis. One never has trouble with therapeutic abortions because they are made complete, but when products of conception, even though small, are left in the uterus, a sapremia results which provides fruitful culture media for the growth of pyogenic bacteria. It is the smaller pieces of placental tissue which are quite large enough to produce sepsis, but are more difficult for the uterus to expel than the larger ones. We remember the protective zone of leucocytes building up its barrier of safety, but we also know that early in the process this small placental fragment furnished the necessity for this reaction and the continuation for the same. Can anything be more logical than carefully removing this exciting cause? We dilate with graduated dilators, taking plenty of time and causing as little trauma as possible. If dilatation is enough, the index finger explores the interior; if not, the curved abortion forceps will take its place. We refrain from the use of the curette, if possible. Curettes have killed more persons than they have saved. Saturated iodinized gauze is packed into the uterus with care, allowed to remain for a moment and withdrawn. We never use intrauterine douches in septic abortion. Rest in bed, opiates, enemas to empty the bowel, with abundance of good food and large hot packs over the entire abdomen, constitute our more common methods of procedure. When the peritoneum is much involved, we morphinize to tolerance, raise the head of the bed, administer hypodermoclysis, glucose and soda bicarbonate by rectum, and liquids by mouth, as soon as they can be borne. Much has been said of electrargol. We have used it in 21, and phenol moniodide in 5 cases, with varying results, sometimes almost spectacular, and again disappointing.

No mortality should occur in spontaneous cases, unless through hemorrhage or the development of chorionepithelioma. The latter eventuality should always be in our thought. The morbidity which results from all kinds of abortions is appalling. The occurrence is progressively more common in the incomplete and septic cases. Complete abortions are often followed by ill health, as a result of hemorrhages, subinvolution, protracted weakness and displacements. It is unnecessary to note that criminal abortion enormously increases both mortality and morbidity, in consequence of the delay in seeking competent advice until the symptoms become pressing, and the infection passes beyond the confines of the uterus.

Taussig, quoting from the report of Sittner's Clinic, shows that in

267 abortions, not attended by fever, only one death occurred; but from 35 septic cases, 3 fatalities ensued, while figures from Maygriers' series gave a mortality in the spontaneous cases of 0.57 per cent, while that of criminal abortion was 56.8 per cent. Undoubtedly, abortion is the most mistreated of all gynecologic conditions.

As an inhibitive measure to criminal abortion, the physician has an opportunity to acquaint the patient with the sequelae of her contemplated act, especially in regard to the wrecking of her health. If she can be made to know that even if she were not to die, a life of invalidism and operations confronted her, she might hesitate though the moral argument failed to appeal to her. We have repeatedly found this explanation to be effectual.

SYNOPSIS OF CASES ADMITTED TO THE RECEIVING HOSPITAL, DETROIT, FROM APRIL 1 TO AUGUST 15

Incomplete septic abortions, 26; incomplete abortions, 23; complete abortions, 15; threatened abortions, 4; postabortal septicemia, 4; miscarriages, 4; postabortal chorionepithelioma, 1; total, 81.

Average days in hospital, 10.7 days; shortest period in hospital, 12 hours; longest period in hospital, 30 days; average age of patients, 26 years; oldest patient, 40 years; youngest patient, 15 years.

Causes.—In the 81 cases, 25 were self-induced; others were produced by midwives or other women. Four were produced by curettement in the doctor's office or patient's home. Others by falling, lifting, etc. Many given as cause unknown were undoubtedly criminal.

Complications. Uterine fibroids, 3; acute anteflexion, 2; cervical lacerations, 2; goitre, 2; acute gonorrhea, 2; follicular tonsillitis, 2; chronic endocervicitis, 2; secondary lues, 4; pulmonary tuberculosis, 1.

DISCUSSION ON PAPERS OF FINDLEY, OAKLEY, AND YATES AND CONNELLY

DR. GEORGE C. MOSHER, KANSAS CITY, MISSOURI.—There are two or three things which I should like to call to the attention of the Association.

In the heart cases, I always took the position that these cases in the absence of hemorrhage or loss of weight should be kept under observation. I have in a measure changed my view in this way but still maintain that a certain number will go through pregnancy and not lose their lives.

Another thing is the symptom of pernicious vomiting as a reason for abortion. We have had seventeen cases in the last two years of which fifteen have been carried through to the termination of pregnancy.

Third, the plan of operation. In five years, from 1909 to 1914, in the Kansas City General Hospital in which I have part of the obstetric service, statistics under the use of the curette during that time showed that the average length of time of each patient in the hospital was twenty-two days. From 1914 to the present, in which period we have adopted the conservative method of treatment and the curette has not been used once, the average time in the hospital has been eight and one-third days. The average cases of complication in the old days was 70 per cent, and our average since using the modern method of treatment has been only 5 per cent.

DR. EDWARD A. WEISS, PITTSBURGH, PA.—Several years ago I presented a paper before the Association which brought forth rather violent discussions, es-

pecially by Dr. Skeel. Since then I have not changed my views, basing my beliefs chiefly on hospital work. It is rather strange that with all the advances in hospital and medical affairs we continue to stand still in the much abused and time honored so-called "therapeutic abortion." Physicians who will go almost to any limit to secure a good result in other cases, will produce an abortion on the slightest provocation. I thought that perhaps I was rather extreme on this subject, but one of my internes told me that his former teacher in obstetrics had fifteen distinct indications for therapeutic abortion, not counting many others that may be supplementary. Is it any wonder then that so many abortions are being performed by the laymen and the quacks when we, as a profession, give them so much leeway and encouragement?

I regret that papers should be read by members of the Association advocating abortions on rather restricted grounds. In twenty years I have never seen a patient die from hyperemesis gravidarum.

In a period from 1910 to 1920, some 114 cases were admitted in my hospital service for interruption of pregnancy. In not one was an abortion performed, and not one of the women died. These were not ordinary cases, such as the usual vomiting of pregnancy, but came under the classification of hyperemesis and other more or less serious conditions. So it seems to me that as a Society, composed almost entirely of teachers in medical schools, or at least heads of departments where we have a large number of internes under our care, we should be extremely careful in giving out these indications for the so-called therapeutic abortions, and further I would like to voice my emphatic protest against advocating abortion in early tuberculosis or mild heart conditions, for I have seen cases carried through, even with pyrexia and loss of weight, and go on to a happy termination and normal delivery.

DR. M. P. RUCKER, RICHMOND, VIRGINIA.—I wish to say a few words about the criminal aspect of abortion. The law is plain enough, but the trouble is, that it is difficult to apply the law in an individual case. I would like to cite an instance that occurred several years ago in Virginia. The students who saw the case first made a diagnosis of puncture of the uterine wall and sent the patient up to the hospital and immediately went up to the detective office to get to work on the legal end of the case while the hospital took care of the medical side. They finally ferreted out the woman who produced the abortion and the crochet needle she had used for the purpose. She made a confession. This happened in January and the trial was postponed until the summer. One student who lived in a distant state had to come back to the trial, at great expense and inconvenience and said he was cured of ever taking part in a criminal abortion again. The woman was bailed. She disappeared and was not produced. This is not an uncommon complication in these cases and is possibly one reason why the medical profession is so loath to take any part in them.

DR. GORDON K. DICKINSON, JERSEY CITY, N. J.—I would like to mention two points very briefly. In the literature, Myer speaks of the great prevalence of abortion in unwashed Rome. I think it has been the habit ever since. It was probably no more prevalent then than now, and it is probably no more prevalent now than it was then.

We control it in New Jersey by having the midwives licensed, and requiring them to be re-licensed every year. If we have occasion to suspect any one of them but cannot obtain full evidence to convict, the license is revoked the next year and she is put out of business.

DR. HUGO EHRENFEST, ST. LOUIS.—I wish to add a few remarks to the points brought out by Dr. Rucker. Some years ago a friend of mine was prosecuting attorney of this city and he had an idea that a group of medical men could help

him in the prosecution of such cases. The result was most unsatisfactory. We were supposed to be *ex-officio* experts for the prosecutor any time he wanted us. I remember one instance when we had the midwife there, the fetus, the catheter and the patient on whom the abortion had been performed. It looked like a perfect case. I was put on the stand and the first question asked by the lawyer for the defense was: "Doctor, do you qualify as an expert in abortions?" (Laughter.) I tried to explain but was forced to answer his questions with "Yes" or "No." And so he made me confess that I had produced several abortions. I had no opportunity before cross-examination to explain that they were all therapeutic. He then asked if I had ever lost any of my abortion cases and I answered "No." He then said, "You are an expert in abortions, go ahead." (Laughter.) We had many such experiences. I have been told by an expert criminal lawyer that the average man on the jury is afraid of the accused midwife because she might know that once his own wife was helped out by her. We could work out the cases any way we wanted to, but we could not get a conviction. I would like to ask Mr. Oakley to tell us concerning the results achieved with our very excellent Missouri law. I should like to know whether there is any midwife or physician in jail in this state; whether there has been for the past ten years, and whether or not prosecutions of these criminal abortion cases do not resemble very closely those under the Volstead Act.

MR. OAKLEY, (Closing on his part).—Of course Dr. Ehrenfest could qualify as an expert on abortion in theory but not, necessarily, as an expert on abortion in practice. The doctor must distinguish between a therapeutic abortion and an abortion in its unlawful or illegal sense. The respect in which he qualified as an expert was as a therapeutic abortionist, I trust, and not in the other way.

The doctor also said something about its being difficult to secure conviction and, in that respect, I take issue. The case is very simple. All that is necessary for the State to allege and prove is the fact that the woman died from peritonitis and general blood poisoning superinduced by a criminal abortion. This must be testified to by the attending physician who was present during her illness and at her death. The other element that is necessary is that an abortion had been performed upon this woman. Although the attending physician did not perform this abortion he has to testify to the cause of death and is disposed of. The autopsy physician is the one who states under oath that an abortion has recently been performed upon the woman; that, in conjunction with the fact that she died of peritonitis, that, although the woman was pregnant, it was not necessary to operate upon her to save her life or the life of the unborn child, is enough to prove the State's case; and these three things are easily and quickly proved. I recall one case in which I had the dying statement of the woman. The general dying statement is not sufficient. The declarant must be under the impression that she is about to die. She must realize this. She must say: "Yes, I am going to die." If you gentlemen will recall this: if, in an emergency, you have any occasion to take yourselves a dying statement, base this upon that question and also upon the following question:—"Have you abandoned all hope of recovery?" and it is safe to say that there is no court in the United States that would not take your testimony. Then she names and states where she went, with whom she went, and what was done to her, and who sent her to this particular man, if a physician; or to the woman, if she be a midwife. In the particular case in which I testified, the dying statement was opposed by counsel for the defendant on the Constitutional provision that the accused must be confronted by the accuser in open court, and it was held by the Court that the accuser in this case was a dying woman, and because of that fact she could not be produced as a living witness against him. But we begged the point, and it was held that it was not the dying statement but the individual who was offering the dying statement who was the accuser, and the defendant was being confronted by the

accuser inasmuch as I took the statement. I was cross-examined as to when, why and where this statement was obtained and in the various legal aspects he had offered. In that case the autopsy physician, unfortunately for the case, fell down. He was not quite sure whether or not an abortion had been performed and was the cause of the peritonitis. He did not know the date and could not tell whether it was a recent or an early affair in the life of the woman, and it was on his testimony that the case went up to the Supreme Court. That Court held that the dying statement was admissable, but that it was not according to the Missouri Constitution corroborated by the positive statement that an abortion had been performed on the woman, resulting in peritonitis and her death, and for that reason the case was remanded and sent back for retrial.

The elements constituting the criminal charge are quite simple, and you will find that no prosecutor will allow his office to issue any information in which he is not positive he can make out a *prima facie* case against the accused.

Another part of the discussion that I listened to—some of the jurors may have employed the midwife, and an aspersion was cast upon the wife of the Prosecuting Attorney in that respect. Now, gentlemen, that may be true. It is analogous in my mind with the prosecution of liquor cases and in the City of St. Louis for the State of Missouri I have the whole jurisdiction. Yesterday I obtained my second indictment, and yet I hold the record for the State of Missouri! (Laughter). They assign different reasons for the failure to convict, but the main reason is that we are all drinking men and therefore we should stand together. That is the attitude of the twelve men trying the defendant, and the physicians, I think, often hesitate, either because of their own particular interpretation of their ethics or because they are afraid of a damage suit, to divulge this information. It is not necessary for a physician to go to an attorney and say: "My patient has been operated upon and Dr. Jones did it", or "Mary E. Smith did it". No, that is not necessary. But it is his duty to go to the coroner in some jurisdictions, and to the police or sheriff in others, and inform that authority what he has found, which to his mind, speaks for abortion of a criminal aspect. That is his duty and after he has done that the authorities can go to the bedside of the patient and, if they are lucky, they will get a statement. I believe that dying statements are secured in perhaps four out of ten cases. It has been my experience that the woman, although she is at the point of death and knows it, to the very end will hold out and refuse to divulge the name of the individual who is responsible for her condition, because she looks upon that individual as her friend. I have in mind an individual who was kept alive by a physician for two weeks longer than she should have lived, but who refused absolutely to make any statement as to who was responsible for her condition, even though she knew she was going to die.

ADDITIONS TO OUR OBSTETRIC ARMAMENTARIUM

By Charles Edward Ziegler, M.D., F.A.C.S., Pittsburgh, Pa.

A NEW METALLIC NIPPLE SHIELD

THE shield shown in Fig. 1 is made of commercially pure aluminum and is perforated as indicated. Its base is 2½ inches in diameter; its dome on the inside is an inch in height, an inch in diameter at the bottom and ⅞ of an inch at the top. Its base is flared to conform to the convexity of the breast and is bordered by a rolled edge.

Metallic nipple shields "for the prevention and cure of sore nipples" are not new. Perhaps the best known is the lead shield invented by Dr. Wansbrough, an Englishman, and described by him in the London Lancet under date of July, 1842. This shield has been used extensively for more than half a century and is still in use; an illustration may be seen in De Lee's Obstetrics. Marvellous curative properties

Fig. 1.

have been attributed to it. Wansbrough claimed that "its curative character consists in the nipple being immersed in a solution of lactate of lead formed by the lactic acid in the milk acting upon the metal."

It is more than likely that lactate of lead has had little to do with the good results obtained. The explanation is to be found rather in the protective character of the shield. Indispensable conditions for the treatment of the abraded, fissured, inflamed and sensitive nipple are: absolute rest of the part and its certain protection against traumatism of every sort, including that of the gown, bedclothing, binder, and occlusive dressings. These conditions the protective shield provides.

If it were possible to carry it out in practice, the "open-air treatment" would undoubtedly give good results. Occlusive dressings, in addition to the traumatism which they cause, favor the accumulation

of moisture and maceration of the epithelium. Hardly secondary in importance, therefore, is the ventilation of the affected nipple.

Whatever differences of opinion there may be in regard to local applications to the nipples, this shield takes care of them. It effectually prevents the application from being rubbed off or absorbed by clothing or dressings and in cases where compresses are being used, the perforations in the top of the dome make it a simple matter to keep the compress wet (with a dropper) without the necessity of removing the shield.

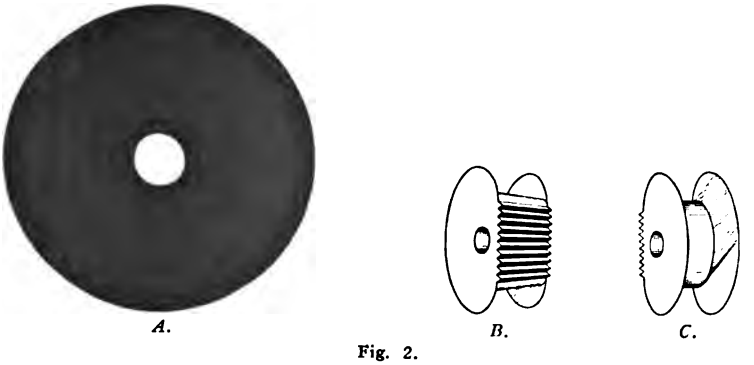

Fig. 2.

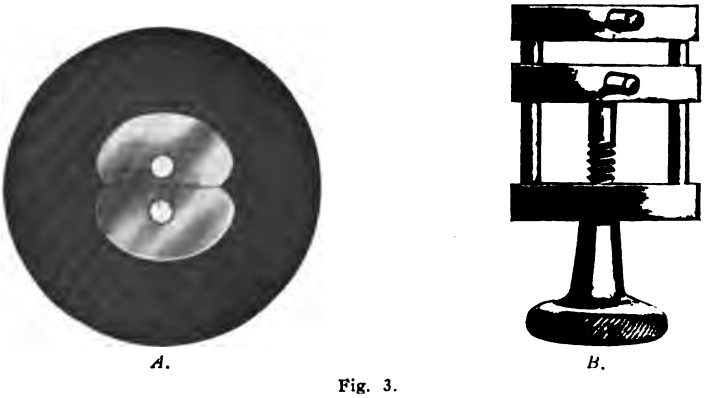

Fig. 3.

The shield is kept in place by means of a properly applied binder or efficient breast suspensory, provided with an opening for the dome of the shield. The breast must be immobilized in any event, since otherwise the nipple cannot be put at rest.

For a number of years this shield has been in use in my service with gratifying results. It is presented to the profession with the hope that it may find a much larger field of application.

AN UMBILICAL CORD CLAMP

Fig 2 represents the separate parts of which the umbilical cord clamp is composed: The rubber disk (*A*)—the sole source of power upon which

the clamp operates—is 1⅝ inches in diameter, ¼ inch thick, with a ¼ inch hole in the center. The companion jaws (*B* and *C*) of the clamp are identical in every way. When their clamping surfaces are properly applied to each other, the little serrations mesh perfectly, providing compression surfaces 7/16 of an inch long and ¼ inch wide. The combined thicknesses of the jaws when in contact, form between their flanges a shaft 7/16 of an inch in diameter. This shaft is gripped by the rubber disk which is held in place by the flanges of the jaws. The disk is made from rubber of the very best quality obtainable for the purpose and the jaws from Monel metal—a noncorrosive nickel alloy which is in no wise affected by antiseptics, blood or other tissue substances.

Fig. 3 shows a side view of the assembled clamp (*A*) closed, also the retractor (*B*) used in opening the clamp and applying it to the cord.

Fig. 4 shows the clamp open with the retractor attached. The opening provided is ½ inch long and 7/16 of an inch wide—sufficient to receive the largest cord.

Fig. 5 shows the clamp closed upon a piece of umbilical cord, as reproduced from a photograph. Note the arteries and vein.

Fig. 6 shows the manipulation used in exposing the surfaces of the clamp jaws for purposes of cleaning—scrubbing with a brush.

The primary object of ligating or clamping the cord is, of course, to prevent hemorrhage; and while it is true that hemorrhage would rarely occur even were the cord not compressed, especially after the establishment of respiration, the fact remains that hemorrhages have occurred and even with fatal termination. In fifteen years I have had two cases of secondary hemorrhage from the cord which were all but fatal. It is likely, therefore, that some form of compression will always be regarded as necessary.

No matter at what point the cord is ligated, separation always occurs at the same place—the skin junction; and always by the same process—death of the stump and its removal by granulation tissue. Mummification or dry gangrene of the stump is of first importance, since it minimizes the chances of infection and hastens its separation. On the other hand moist gangrene, infection, and delayed separation go hand in hand. Asepsis and the elimination of moisture are therefore indispensable considerations in the treatment of the stump. If this be true, it then follows that under similar aseptic conditions that form of compression is best which most completely squeezes out the moisture from the tissues of the stump. In this respect there can be no question but that the clamp has great advantage over the ligature and that a clamp such as I am describing is far more effective than the usual artery forceps type of clamp, for the reason that there is no yielding in the compression as the tissues of the cord give way.

The serrations on the jaws of the clamp cut through the amniotic covering of the cord and thus facilitate the escape therefrom of the jelly of Wharton and other moisture. The clamp moreover fixes the stump and through the slight traction which it exerts upon it, keeps it elevated and away from the skin of the abdomen where perspiration otherwise adds to its moisture.

Fig. 4.

Fig. 5.

Fig. 6.

From what has been said it is evident that next in importance to asepsis, is the removal of all moisture as fast as it is squeezed from the stump by the clamp. This may be accomplished best by the liberal use of sterile absorbent cotton packed closely about the stump between the clamp and the skin. Gauze will not do since it is less absorbent than cotton and impossible to keep in close contact with the stump. A convenient way of utilizing cotton for the purpose is to be found

in the form of a pad a half inch or more in thickness, with a small hole in its center. The pad is passed down over the cord by pulling the latter through it with an artery forceps. With the pad in place, the cotton is packed snugly about the stump with a tissue forceps. After applying the clamp to the cord close to the skin junction, the cord is cut just beyond the retractor, the retractor removed, the stump and clamp covered with a similar pad of cotton, and over all a sterile gauze binder, pinned in place.

It has been our experience that if the cord is crushed with an artery forceps before applying the clamp, the time of separation of the stump is materially shortened. Following this procedure we have invariably found the stump at the end of 72 hours either completely separated or reduced to a very thin parchment-like remnant readily twisted off by rotating the clamp.

Because of its small size, light weight and adaptable form the clamp may be incorporated into the cord dressings without discomfort to the baby and may be either left in place until the stump drops off or removed after some hours as is done with other clamps.

To those members of the profession whose custom it is to clamp the cord, this clamp will make its strongest appeal. Its simplicity, durability, compactness, strength and unyielding dependable pressure, leave little to be desired.

AN IDENTIFICATION WRISTLET FOR INFANTS

Preventing babies in a hospital nursery from "getting mixed" may not be regarded as a difficult task and yet it demands constant watchfulness. Various devices for "marking the babies" are in use and accomplish the purpose, but so far as I know an entirely satisfactory one has as yet not been announced.

The marks of identification must be in plain view or readily accessible at all times; they must be capable of instant and unmistakable interpretation; they must be proof against mutilation, soiling or other agency which may destroy them or render them indistinct; and the device which carries them must be sanitary, substantial yet simple, capable of being quickly and easily applied, free from discomfort or injury to the baby, and must be reasonable in price. To meet these requirements, the wristlet which I am presenting has been devised.

Fig. 7-*1*, *2*, *3*, *4*, *5*, and *6* were made from drawings of the component parts of the wristlet, and, while somewhat diagrammatic, nevertheless give correct ideas of form, relations and detail. Fig. 7-*7* is an excellent reproduction from a photograph of the wristlet as it appears in use, with seal attached.

Fig. 7-*1* represents the mounting of the wristlet which has been pressed into shape from a single piece of metal. It is curved to conform to the more or less oval contour of the wrist and has two com-

partments—*A* and *B*: *B* to receive the rubber band (*2*) upon which it is mounted; and *A* to receive the identification label (*3*) and the celluloid shutter (*4*), which latter covers and protects the former. The mounting is ⅞ of an inch long, is ½ inch wide and made of Monel metal, a noncorrosive nickel alloy.

Fig. 7-*2* represents the rubber band which encircles the wrist of the baby and supports the mounting (*1*) described. The band which it is proposed to make from steel-gray rubber (not black as indicated), is ½ inch wide and 1/16 of an inch thick with local expansions. It has inside diameters (being oval) of ⅞ and 1⅛ inches respectively—the

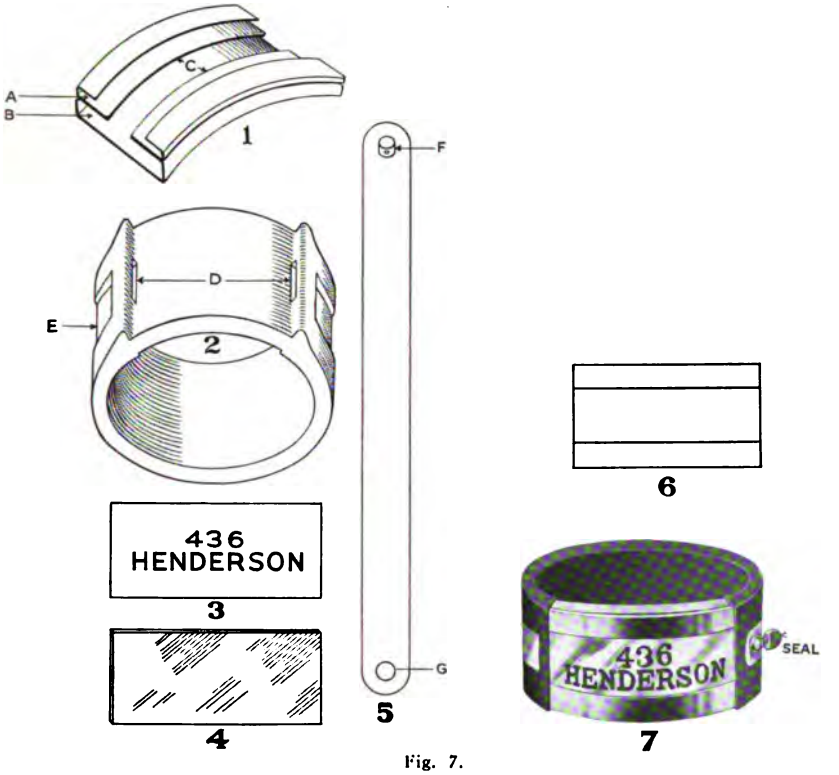

Fig. 7.

size which fits comfortably the arm of the average infant during the first weeks of life. A larger size will have to be provided for the very large babies.

All exposed edges of the mounting are well protected by the overlapping edges of the rubber band. The two prominent ridges or expansions running across the band on the outside, with abrupt vertical surfaces facing each other, serve the especial purpose of sealing compartment *A*, after the identification label (*3*) and the celluloid shutter (*4*) have been shoved into place. The sunken channel (*E*) encircling the rubber band on the outside, together with the openings (*D*) com-

municating with it, are provided to receive the flexible metal tape (*5*) to be described.

It will be seen that in order to get the rubber band into compartment *B*, it is simply necessary to stretch it until its reduced size passes the narrow rectangular opening (*C*) between the two compartments. That part of the rubber band which lies between the two expansions described, is the portion which fills compartment *B* and in length is ¼ inch shorter than the compartment. When therefore the band is released after passing into compartment *B* and regains its former size and shape, the ends of the mounting (*1*) become well embedded in rubber and compartment *A* very effectually sealed at either end.

Fig. 7-*3* represents the identification label containing the room number and name of the mother of the baby—a paper label of the thickness of ordinary writing paper used for business purposes. Because of its small size (⅞ by ½ in.) the label is trimmed after being inscribed, from a stock label (2 by 3 in.) upon which is printed the rectangular figure (*6*) outlining the exact size of compartment *A* and indicating the space available for the inscription.

Fig. 7-*4* represents the celluloid shutter of the size of *3* and of the weight and material used in automobile curtains. It serves as a transparent shutter covering and protecting the identification label (*3*) and fitting snugly into compartment *A* exernal to the label which is inserted first.

Fig. 7-*5* represents the flexible metal tape 3/16 of an inch wide, used in sealing the wristlet on the arm of the baby. It will be seen that in the assembled wristlet, the rectangular opening (*C*) beween the compartments *A* and *B* of the mounting (*1*) becomes a tunnel which opens at either end through *D* into the sunken channel (*E*) surrounding the rubber band on the outside. After the wristlet has been placed upon the baby's arm, the metal tape (with the free end containing the hole *G* in advance) is inserted into the opening *D* from one side, is pushed through the tunnel (*C*) out through *D* on the opposite side and thence along the channel (*E*) around the rubber band to the starting point where the pin (*F*) on the other end of the tape has arrived. The hole (*G*) is passed over the pin (*F*) and the tape is sealed in place by crushing a perforated shot upon the free ends of a piece of very soft copper wire passed through the hole near the top of the pin.

The Wristlet in Use.—The wristlet will be received by the hospital with the mounting (*1*) in place upon the band (*2*). All that the nurse needs to do is to take a label from the supply box, write the room number and name upon it, trim it to the size indicated and slip it into compartment *A* and over it the shutter. By pulling upon the band just beyond one end of the mounting and then turning the stretched end into the concavity of the mounting and holding it there, the corresponding end of the compartment will be fully exposed so

that shoving the label and shutter into it becomes a very simple matter. The wristlet is now ready for the baby and is applied by simply stretching the band until it passes over the baby's hand and the wristlet is in place. The metal tape is next applied as above described and the seal attached. The wristlet should be gotten ready during the labor and put on before the baby leaves the delivery room.

DISCUSSION

DR. EDWARD A. WEISS, PITTSBURGH, PENNSYLVANIA.—Regarding the clamp the doctor has described I will say that this is one of the appliances we have been using in our department for some time, with very satisfactory results. From the picture one would think it was rather complicated, but it is quite simple and has a great deal to recommend it. A cotton, not a gauze, pad between the clamp and the skin, it really absorbs the moisture and makes it very efficacious. The cord is mummified and drops off after seventy-two hours.

DR. JOHN O. POLAK, BROOKLYN, NEW YORK.—These devices of Dr. Ziegler's are very ingenious. Personally, I feel that the clamp is rather complicated and that it might be difficult to use. As a rule, we are all trying to make obstetrics just as simple as possible, and we have all gone through tying off the cord and burying it, as suggested by R. L. Dickinson several years ago, and have tried various ligatures, yet the fact stands out that the clamp is the most satisfactory method of treating the cord. This clamp, if it has the advantages Dr. Ziegler claims for it, certainly deserves a more extended application.

Regarding the wristlet, there is no doubt that it is very good, but there is a chain necklace on the market at present that is really so simple that we cannot see the use of a more complicated and expensive device. The baby's name is threaded in lettered beads on an ordinary trout line and the necklace is put about the neck and sealed and clamped before the child leaves the delivery room. In that way the baby's name is stationary and when the child is sent down to the office for discharge the family either buy the necklace or they cut the necklace off. Recently we have had the lettered beads painted with radium paint so that they may be seen in the dark.

DR. ZIEGLER, (closing).—I have little to add except to say that the clamp is very simple when you come to use it. Perhaps the pictures have made it appear more complicated than it really is. I am finding it very satisfactory and am never in doubt as to results.

In regard to the necklace mentioned by Dr. Polak, I am familiar with it. The principal objection to it is that the letters do not remain in alignment. The name is therefore at no time in full view and is accessible only through spelling it out by adjusting each bead in its turn. The lettered beads, moreover, are usually to be found behind the baby's neck or back.

As to the wristlet: The pictures and detailed descriptions of the parts of the wristlet, appear to have complicated it. It is in fact very simple. My own opinion in regard to the sealing device, is that in most hospitals it will likely be regarded as unnecessary. As the wristlet is put on by stretching the band, its removal requires some little trouble. Nurses and other attendants have no object in deliberately removing the marks of identification from one baby and putting it on another. However, the sealing device is there if wanted; if not, it may be left off. With the wristlet, the name is in plain view at all times. The name label being covered with the celluloid shutter and in a sealed compartment, is effectually protected against mutilation or soiling and cannot be removed while the wristlet is on the arm. Even boiling does not affect the legibility of the name; it only serves to seal the compartment the more effectually, through the expansion of the celluloid.

TEACHING UNDERGRADUATE OBSTETRICS

By A. M. Mendenhall, M.D., Indianapolis, Ind.

DURING the last twenty years there have been a few valuable contributions to the practice and teaching of obstetrics, but no progress has been made toward reducing the total number of maternal deaths due to childbirth. Only a casual glance over the records of vital statistics in the registration areas of the United States is necessary to see clearly there has been, on the contrary, an increase in the maternal death rate.

In order that this may be proved beyond doubt, we must go back at least twenty years and note the gradual increase and not be misled by going back but three or four years and, thereby, fail to consider the fact that the years 1918 and 1919 saw a very great increase which, in reality, was largely due to influenza.

In a recent article by J. O. Polak[1] it is stated that "from 1902 to 1919 there was noted an increase to approximately three times as many deaths from sepsis, four times as many deaths from eclampsia, and twice as many deaths from other obstetric causes, besides the hundreds that die annually from indirect results of labor, as from injuries and consequent operations for repair, from nephritis originating during pregnancy, and from endocarditis aggravated by repeated labors."

By careful analysis of the records we find that, in 1916, there were approximately 16,000 deaths due to childbirth and, in 1918, 23,000, this marked increase being largely due to influenza. Nevertheless the one outstanding fact remains, that approximately 20,000 women die annually in the United States as a result of pregnancy and labor. Out of this number of deaths, approximately 28 per cent are due to sepsis alone,[2] a fact that seems but a sad reflection upon our care of the puerperal patient. Also, about 20 per cent of these deaths are due to toxemia of pregnancy, although it is well known that proper prenatal care should very greatly reduce these figures.

The number of infants lost as a direct or indirect sequela to improper obstetrical care, is appalling in the extreme. If we add to this the great morbidity rates for mothers and infants, for which we have no satisfactory statistics yet very logical deductive evidence, it at once becomes apparent that we are falling short of our duty.

In other branches of medicine, almost without exception, there has been marked progress in the last two decades; but in obstetrics we have but little to which we may point with pride. And when our attention is called to these facts it seems well to pause long enough to try to find the reason.

The writer is becoming more and more convinced that one of the fundamental reasons is that there are some defects in our methods of teaching obstetrics.

We will agree in advance with all those who feel that the laity must become better educated to the fact that the process of childbearing is not a normal physiological event, and that every primipara who gives birth to a full term child has, at least, some pathologic lesion, and that this may be, and frequently is, quite serious if not fatal. We realize that if the laity could be made to thoroughly understand these facts, a great obstacle would be eliminated and much progress could be made; but this would by no means answer the whole question. And before we can hope for even a small minority of the laity to understand this, we must be sure that their instructors, the physicians themselves, are properly impressed with these facts. Rarely does the obstetrician pass a day when he does not see or hear of some practitioner who still feels that obstetrics requires but little skill and care. Hence our first and greatest defect in teaching obstetrics in the past has been that we have failed to impress our students with the seriousness of the case, when they are conducting the care of a woman through the period of pregnancy, labor, and the puerperium.

This is in part due to the fact the heads of our teaching institutions have been and still are unwilling to place the department of obstetrics on its proper level with the departments of surgery and medicine. They themselves have not been properly impressed with the importance of obstetrics and do not regard it as a definite and independent specialty and are, therefore, unwilling to give this department its proper ratio of time and equipment.

Many educators feel that we are rapidly approaching the time when the busy obstetrician, as well as other clinicians, must have compensation commensurate to the services he renders his school, else the service may become too largely delegated to assistants and more inferior teachers. Whether the head of the department of obstetrics should be a full time professor is a question which is confronting us at the present and, if this offers a real solution for the better teaching of obstetrics, it is deserving of careful consideration. But it is with conditions as they exist at present that I desire to search for weaknesses and offer remedies.

In this attempt I have sent out a questionnaire to twelve of our leading representative teaching institutions in the country with the view of determining, as nearly as possible, how the departments of obstetrics are being conducted.

The first two questions are as follows: "In what year of the medical course is obstetric teaching begun?" "Of what does the first course consist?"

The answers to these questions are quite uniform, showing that a general didactic course in embryology, and the physiology of pregnancy, labor, and the puerperium is started in the third year. In a few instances we find that didactic obstetrics is introduced in the second year. Unless the student has completed his courses in anatomy and physiology, as well as having had some training in physical diagnosis, it is very doubtful whether he is ready for didactic obstetrics; and, since these elementary and fundamental subjects are, in most instances, not completed until the end of the second year it would seem that obstetric teaching is best introduced in the third year.

The next four questions were submitted with the idea of ascertaining the relative importance given to didactic, clinical, and manikin courses, and the average length of time devoted to each of these divisions. The replies showed that 86 hours were given to didactic obstetrics, 81 hours to clinical obstetrics and 31 hours to manikin practice. There were no wide variations in these answers except that one school has as many as 90 hours of manikin practice, and another as few as 8 hours. It is doubtful whether 8 hours is more than one-fourth sufficient time for the student to have in manikin practice. If a proper demonstration is given, and then the practice on the manikin is properly supervised, there is little doubt but that 30 hours can be most profitably utilized in this method of teaching. One of the most important fundamentals in the study of obstetrics is a perfect understanding of palpation, corroborated by an actual view of the various points considered in presentation and position, and a familiarity with the various manipulations to be acquired in prolonged work over the manikin. The average student has great difficulty in memorizing from lecture notes or textbooks the many points which can be made very practical and easy for him to remember, by a properly conducted manikin course. Less than twenty-five or thirty hours spent in this work will certainly leave much to be learned.

The next question proposed was "When, in the obstetric course, is the manikin practice started?"

There was but little uniformity in the answers received, but there seemed to be very excellent reasons why this course should be delayed until late in the senior year, after the student has completed, or practically completed, the didactic lectures in obstetrics. In other words, after he has had a thorough course in the theory of obstetrics, the manikin instruction will be a supplementary, practical application of his theoretical knowledge; it will serve to emphasize by sight and touch those facts which have been presented didactically.

The next three questions were closely related and will be discussed together. They are: "On an average, how many deliveries does each student see in a hospital?" "Are these deliveries conducted by mem-

bers of the staff or by internes?" "In how many hospital deliveries does each student actively assist or personally officiate?"

These questions brought out the fact, that on an average, about fifteen hospital deliveries are witnessed by each student; but some schools fall far below this average and, the most lamentable fact is that these deliveries, unless abnormal, are almost invariably conducted by internes. The average interne is but very little more skilled than the student and has, as a rule, received his training in the same imperfect way, and falls very short of the proper amount of knowledge and skill to be posing as an instructor. In no instance, probably, is the truth of the old adage so well seen as here,—"He who is teaching all he knows is teaching very poorly." In other words, the student ought to see a number of normal as well as abnormal deliveries, in a well conducted maternity, by some one who understands thoroughly the art and science of obstetrics and who has an intimate speaking knowledge of the mechanism of normal labor and the ability to demonstrate the conduct of such a delivery. When a recent graduate goes into practice, most of his cases will probably be the so-called normal labors, and it is in regard to the conduct of such cases as this that he should have been most carefully and painstakingly educated. When the chief of the obstetric department does not take sufficient interest in these cases to make sure that his students are properly instructed on this most vital part of the course, he is not only neglecting an opportunity to do a vast amount of good in a comparatively short period of time, but is falling decidedly short of his duty. It contributes strongly to a real weakness in our teaching the subject of obstetrics. In some of our maternities where there is on duty a resident obstetrician, who presumably, and usually does have, an obstetrical knowledge far in excess of the average interne, it may be right and proper to allow him to act as demonstrator in normal deliveries; but this must be left to the decision of the chief of the department. When we have educated the profession and the laity to a greater appreciation of hospitalization of obstetrical cases, and when our teaching institutions own, or control, much larger maternities than at present, we will be better able to permit students more frequently to assist or officiate in the delivery, under skilled supervision, of at least a few hospital cases, although the answer to this question shows an average of but two deliveries. Three schools reported that they make no attempt to let the student assist in labor cases.

The next four questions bear upon antepartum and postpartum care and were as follows: "How many antepartum cases are examined by each student?" "Is there a regular antepartum clinic conducted and is a member of the staff present at dispensary hours?" "Does each student have ample opportunity to see hospital postpartum care?"

"Does each student have ample opportunity to see the hospital care of the newborn baby, and of premature babies?"

The answers to these questions were very gratifying. They showed that an average of sixteen complete antepartum examinations are made by each student, that every school conducts a regular antepartum clinic, and that a member of the obstetrical staff, or a resident obstetrician, is always present at the dispensary hour.

With this part of the obstetrical course so well provided for, the writer has no comment, other than to say that in obstetrics, as in other branches of medicine, diagnosis is of transcendent importance and that a well conducted large antepartum service for each student cannot fail to greatly enhance his knowledge of obstetrical diagnosis; and that prolonged service in this department will go very far toward impressing him with the great importance of prenatal care and thorough antepartum examinations, measurements, and records.

As to postpartum hospital care, it seems that all schools are availing themselves of ward work and bedside instructions to the extent of their capacity; all agree that the student should see and know as much as possible about the puerperium.

The next three questions bear upon abnormalities and are as follows: "How many forceps deliveries are observed by each student?" "Does each student assist in at least one forceps delivery?" "Does each student, under staff supervision, perform or assist in performing at least one second degree perineorrhaphy?"

The replies to these questions show that an attempt is made for all students to witness a few forceps deliveries, but very little opportunity is given for assistance. A number of students are graduated without ever having assisted at a forceps delivery or a perineorrhaphy. Whether or not this should be left until the interneship period, brings up three very important questions. First, whether right or wrong, we are confronted with the fact that there are still many graduates who go direct into practice without having served an interneship. Secondly, whether the physician in general practice should be considered competent to apply forceps may be questioned; but he is doing it and, undoubtedly, will continue to do it for a long time to come, and it certainly seems that his first experience should not be in the home of the patient and without competent supervision and assistance. Thirdly, granting that he will serve an interneship, is it right and proper that his first personal experience with the forceps should not be supervised even though it be under hospital conditions? Not long since, I saw this idea put into practice with a really very unique result. The left blade of the forceps was skillfully applied, but as the right blade was inserted it was so rotated and manipulated that it found its way to the same side of the pelvis as the left blade. Without super-

vision, it may have been difficult for this newly appointed interne to have discovered his error and to have properly corrected it. So long as our graduates continue to go out into practice with the mistaken conviction that they are competent to do forceps deliveries, we believe there should be a marked increase in their opportunity to obtain more training under supervision; and, certainly, no man should practice obstetrics who is not competent to repair a second degree laceration of the perineum. I do not believe he will attain this competency in any way whatsoever except by personal assistance under skilled supervision.

The eighteenth question in the questionnaire was upon the subject of outdoor obstetrics and is subdivided as follows: "(a) How long is each student on outdoor obstetric service? (b) How many cases does he deliver there? (c) To what extent is he followed up and supervised by members of the obstetrical staff? (d) Does a member of the staff see many of the outdoor cases during labor or puerperium? (e) About what per cent of the cases are thus visited?"

The average length of time spent on outdoor obstetrics was found to be eighteen days, and the average number of cases delivered was fifteen.

In one of our leading institutions the answer, as to whether a member of the staff sees many of these cases, was negative. This I know to be a frank confession, and I cannot look upon it except as a very sad commentary on pedagogical methods, as well as from a standpoint of the patient's interest.

This naturally leads to a discussion of outdoor obstetrics in general. What is to be gained by it and what are the pitfalls? It is refreshing to learn that one of our best schools has no outdoor deliveries. This school has a thoroughly supervised prenatal clinic. It is one of the schools which gives ninety hours to manikin practice, but does not feel that the outdoor deliveries can be sufficiently supervised to be worth the time and effort on the part of the student, at least if a reasonable maternity service is available. There are but two points to be gained by this so-called tenement obstetrics; the one is confidence and self-reliance, the other is an opportunity to see and examine a few women in labor. Self-reliance is desirable and should be cultivated, but it is very doubtful whether it cannot be better and more safely acquired otherwise. Confidence, in a degree is desirable, but with it comes two dangerous pitfalls. One is that the student attends a few so-called normal labors and Nature is good enough to permit the patients to survive, and the result is that the student develops very early a superabundance of confidence and begins to look upon labor as too nearly a normal physiologic process. Then, too, unless he is most thoroughly supervised and followed up, his many

errors are not pointed out to him and he goes ahead fully persuaded he has been entirely right. The technic followed in most outdoor obstetric departments is crude at the best, yet the student is quite sure to decide it is good enough. If we are going to contribute our part toward reducing puerperal sepsis, we must persistently teach the most rigid labor technic, as we cannot expect the student when he goes into practice to follow a better technic than he has been taught. In fact it will usually be very much inferior. Therefore, if we permit the impressions to make headway in his mind which are, ordinarily, obtained in his outdoor obstetric work in college, they will be very likely to become permanently implanted there.

The last two questions were as follows: "How many beds have you available for obstetric teaching? Are these beds entirely under control of the school?"

It was found that an average of 46 beds was available for obstetric teaching and these were, generally, under control of the school. Hirst maintains that the school should assign more beds to obstetric teaching than to either medicine or surgery, because the average instructive capacity in each case is limited to one or two students. In this same article Hirst[3] advocates that a school having 400 students should have 100 beds available for the teaching of obstetrics, although it is to be remembered that he is a strong advocate of a combined department of obstetrics and gynecology and these figures are given on that basis. The controversy as to whether these two subjects should be combined for teaching purposes will not be discussed in this paper. The one outstanding fact is that any school pretending to educate students in obstetrics should have 50 to 100 beds available for this purpose alone, and these should be absolutely under the school's control, and not under the control of any private or city institution. In this connection I cannot do better than quote from a recent address by Polak[4]: "In order to turn out men who are even qualified to attend a primipara in labor, there must be greater clinical facilities for instruction of our students. Millions are expended every year for research and laboratories but almost nothing is given to the establishment and maintenance of properly equipped maternity hospitals. Why, if it is necessary for the American College of Surgeons to require an apprenticeship in surgery before a man can be recognized as capable of doing a surgical operation, is it not just as necessary that the man who is to deliver a woman should have sufficient training to insure a satisfactory recovery and a live baby?"

The writer would ask further: Why teach a man to practice obstetric operations in the homes of the patients and condemn him for doing an appendectomy in the same place?

CONCLUSIONS

1. A greater effort should be made to impress the student that obstetrics is a major division of the medical curriculum, and that few, if any, primiparas are ever delivered of full-sized infants and left in as perfect condition as before delivery.

2. Then, when the student goes into obstetric practice, he will carry this impression with him to the laity and do his part toward educating the public as to the importance of proper obstetric care.

3. More emphasis should be laid upon the proper management of so-called normal labor cases, and not so much of the student's time taken up in trying to teach him the various kinds of cesarean sections and other obstetric operations which should only be performed by the skilled obstetrician.

4. So-called outdoor obstetrics is, at its best, of little real value to the student, and it would be better to abandon it entirely, than to continue this sort of teaching without very thorough and continuous supervision by the teaching staff.

5. Since diagnosis in obstetrics, as in all other branches of medicine, is the real foundation for proper care and treatment, it is well to utilize every possible opportunity to teach this branch most thoroughly, and that the student's ability in this line be developed by prolonged manikin practice, by large numbers of antepartum examinations, and by wide clinical experience.

6. Teaching by internes, or by those who have but very little more knowledge, is sure to create a wrong impression as to the importance of the subject, and to fall very far short, directly and indirectly, of the result desired.

7. One of the most important ways in which we can soon obtain better results in teaching obstetrics, is to educate the laity and our hospital managers to a realization that a large and well-equipped maternity is the best place to teach and practice obstetrics; and that this will at once contribute strongly toward a reduction in the fetal and maternal death rates in the community in which it is established, as well as in the communities where the students later go to practice.

REFERENCES

(1) Jour. Am. Med. Assn., lxxvi, No. 26, 1809. (2) Am. Jour. Hyg., March, 1921, i, 197. (3) Am. Jour. Obst. and Gyn., Nov., 1920, i, 128. (4) Jour. Am. Med. Assn., lxxvi, No. 26, 1810.

DISCUSSION

DR. O. H. SCHWARZ, St. Louis, Mo.—In this very important paper we all more or less agree with what has been brought up. It is very important that in the future if obstetrics is to keep pace with medicine and surgery so far as teaching is concerned, this branch will also have to be put on a full time basis. Such a condition will undoubtedly improve the Out-Patient Department as far as teaching is concerned. In most instances such departments do not get the proper supervision,

and certainly a full time man will be able to supervise such departments better than men who are also engaged in private practice. We are now attempting to have at least an interne present at each delivery, so that he can instruct, in some measure in these cases.

The ideal thing, of course, is a maternity hospital, with a number of beds available for teaching purposes. Fifty beds would probably be more than sufficient.

I do not believe that manikin practice needs so much attention as has been pointed out. I believe individual work with the patient will do much more than the manikin practice, and I would like to know just what is carried out in 90 hours of manikin practice.

Another thing that will help in the teaching of obstetrics, particularly the abnormal deliveries, breech extraction, face presentation, etc., is the moving picture film. I have had the opportunity of witnessing the pictures taken at the Wertheim Clinic and some of these films were particularly good, especially those showing breech extraction, podalic version and face presentation. They are shown almost as well as these cases could be demonstrated in the delivery room. With the proper apparatus the pictures could be shown repeatedly and stopped at any stage in order to bring out a particular point. I believe such pictures will be of very considerable value in the teaching of obstetrics.

DR. JOHN O. POLAK, BROOKLYN, NEW YORK.—The question is, what and how much should we teach the undergraduate in obstetrics. I have taken the position for a long time that we should limit our instruction in obstetrics to teaching the management of normal obstetric cases and obstetric diagnosis. We have paid a great deal of attention to the antepartum examination. At the Long Island College Hospital each student spends four weeks in constant attendance in the antepartum clinic, and each man will make twenty-five to forty examinations, which are checked up by the man in charge, who is a part time paid instructor. We try to teach the student the aseptic conduct of labor. We know it is not possible to carry into the private home the paraphernalia so common in a maternity delivery room, and so we teach intensive asepsis,—the doctor's hands, the parts of the woman and the operative field are aseptic, and the student must use just as much care to deliver the woman as he would to open the abdomen. Then we teach him the course of labor. From the first moment the woman falls into labor, he is in attendance and does not leave until she is delivered. He sits up with the patient and without attempting to hurry her dilatation, he records the pains and the results of his examination by rectum, listens to and records the fetal heart every half hour during the first stage. During the perineal stage the heart is studied at intervals of ten minutes.

We believe that labor is a surgical procedure, that the delivery of the primipara is just as important as the opening of the abdomen, and we tell our students that all we can teach them is diagnosis and progress of normal labor. If they want more than that we are willing to give them an internship, and if they want still more, we are willing to give them a residence if they make good. We tell them they cannot expect to go out and deliver a woman if they do not know how to repair an injury and when to interfere. All we can teach them is when to interfere; we cannot teach them how to interfere in the short time available. Here is where the manikin comes in. They can practice forceps and version and breech extractions on it and the first case they have to use forceps on they realize the benefit of this practice. The man who has never handled forceps on a manikin is absolutely at a loss. Every man will have a breech presentation sooner or later, and if he has had no practice in extraction on a manikin he is useless. We do not consider these men skilled, but they get the fundamentals during the course.

We need more hospital facilities, we need full-time men. We cannot teach ob-

stetrics without some full-time men, and these are the facts we have to make known so that the public will give of their money and we can get the hospitals so that this work can be carried on properly.

DR. JOHN NORVAL BELL, DETROIT, MICHIGAN.—I think if they would incorporate in the Sheppard-Towner Bill a clause providing the money to pay a man to teach men how to deliver a normal case we would get good teaching. You cannot expect a man to get up in the middle of the night and go and teach students how to deliver a normal case, and that is the whole sum and substance of the thing. I believe firmly in having a full-time man, or two or three, available in the institution, but they must be men who know how to teach the students to deliver a perfectly normal case.

DR. WILLIAM H. CONDIT, MINNEAPOLIS, MINNESOTA.—I think we have struck the keynote of our future professional needs in our efforts to reduce the morbidity and mortality of the puerperal state. We have made no progress in the last twenty years. The rate of maternal mortality per 1,000 births in 1920, was 15 per cent above the rate in 1919. The United States is fourteenth of all the countries of the world. I think our weakness is in teaching students. The requirements of the students today are so advanced that by the time they are sophomores, they know all to be known in medicine. We, at the University of Minnesota, have our shortcomings, especially in regard to our personal supervision and teaching by the chiefs of the departments. We do little didactic teaching, chiefly quiz work. We have a valuable adjunct in our Fellowship coterie. We have a Fellow or two on a three year course. He has had some actual practice in general medicine and maybe in surgery. The interne is not given any actual teaching responsibility, but the Fellow under the chief is given quite a good deal of responsibility. He is in charge of the Out-Patient Department and the uncomplicated deliveries in the hospital and they are under the supervision of the instructors or of the chief himself. I think this is proving very practical; more time can be spent by him in detail technical teaching of the student. In the last year of the Fellowship he does some operative work, both in gynecology and obstetrics. We cannot help feeling that our students go out pretty well trained. There are some who should never deliver a woman. I had a junior student at the bedside very recently and the first thing he did was to begin stripping on his glove with his bare hand. Then he rushed up to cleanse the draped patient with nothing but his rubber apron on. We should not be compelled to teach a man the first principles of asepsis in his Junior year when he begins his course in obstetrics. There is evidently weakness in other departments. We cannot make experts out of poor material, but we must try to teach the student so as to prepare him for the practical, bedside, country practice. We must impress the student with the importance of this being a surgical procedure, needing probably more careful and more cleanly technic than even many surgical operations. We do not allow our students ever to make a vaginal examination. We teach the rectal examination and I think that is one of the preventives of many accidents that happen in the country practice.

DR. JAMES E. DAVIS, DETROIT, MICHIGAN.—Just a word in regard to one angle of this problem that I think has not received due attention and emphasis. After listening to the paper and discussion I could not help being impressed with the undue emphasis that has been laid upon the mechanics of this work. I, for one, do not believe that the mechanics should be overemphasized, especially with the undergraduates. Many of the best teachers are saying that the less you do in a mechanical way the better your patients are cared for. Therefore, I want to call attention to this side of the question for the undergraduate. The point I wish to make is this: If greater emphasis were laid upon the bacteriology and the path-

ology of the birth canal, and if the students were taught to be alert for all the conditions that may arise, I am sure they will obtain impressions that will not become easily effaced and will prove of greater value than information obtained from the manikin or from much of the outdoor clinic work, or from a certain number of cases conducted in a purely mechanical way. The examination of the placenta is also important. It is a common observation that when this organ has a dirty yellow appearance, in the majority of instances, there is infection. It is important also to know that cross sections of the placenta may reveal conditions which will postulate certain things having taken place before birth, thereby making one alert for persisting pathologic conditions in both the mother and the child. Specimens illustrating the gross and microscopic pathology are invaluable in teaching this subject.

DR. MENDENHALL (closing).—I expected more criticism and am disappointed. I believe that the out-door department must be continuously supervised. If it is so done, it is of inestimable value, but in most institutions it is not so done. Usually the student delivers the patient and does not know whether it is a posterior or anterior delivery.

Dr. Schwarz, I think, misunderstood my remarks on the manikin work. I mentioned ninety hours at one school, but recommended thirty to forty hours. I still believe that manikin work is invaluable. I agree with Dr. Schwarz that work with the patient is better if we can have enough patients. If not, the work with the manikin is second best, at least, for practical experience.

A point that Dr. Polak brought out I wish to emphasize in closing, and that is the question of diagnosis, and how much the early graduate is going to do in obstetrics. In this, I am reminded of my last lecture by Dr. de Schweinitz on diseases of the eye. He told us he was not turning us out as ophthalmologists, but hoped he had taught us enough to know when to call for help from an ophthalmologist. I hope we may teach the students enough to enable them to know when to call for consultation in obstetrics.

THE ACTION OF THE COMMONER ECBOLICS IN THE FIRST STAGE OF LABOR

By M. Pierce Rucker, M.D., Richmond, Va.

From the Department of Obstetrics, Medical College of Virginia.

THE use of dilating bags affords us an excellent opportunity of studying the variations in pressure that take place within the uterus in the first stage of labor as the result, not only of changes in posture, respiration, vomiting, etc., but also of drugs commonly used at this time. It is to this phase of the subject that I wish to direct your attention. I can find no reference to the Voorhees bag being utilized in such a manner. Schatz,[1] 1872, obtained tracings of uterine contractions by introducing a small rubber bag, attached to the end of a stiff tube between the amnion and the uterine wall. The bag was partly filled with water and was connected with a manometer which not only measured the intrauterine pressure, but recorded it upon a moving drum. H. Hensen[2] made use of Schatz' method to investigate the influence of morphine and ether upon labor pains. In his article he states that Smolsko, (1876), found that moderate doses of quinine strengthened and lengthened uterine contractions without changing their physiologic character, and that larger doses caused the contractions to cease entirely. Rubesamen[3] criticizes Schatz' method first, because a foreign body is introduced within the uterus, which might possibly influence uterine contractions, and, secondly, because with it you are unable to investigate the third stage of labor. He used in his work a 500 gm. weight that rested upon the abdomen and was connected with a writing lever by a string and a series of pulleys. Such an arrangement would give an accurate record of the rhythm of uterine contractions in all three stages of labor and the height to which the uterus rises at each contraction, but does not measure the intrauterine pressure or the strength of the contractions, nor could it give information as to the effect of coughing, vomiting, etc. He found that quinine stimulates contractions slightly when the uterus is already contracting, but that it does not initiate them. It seems entirely inactive when used in postpartum atony.

The method that I have employed in making the tracings can, of course, be used only in the first stage of labor. In fact, towards the end of the first stage, when the bag is nearly out of the cervix, the manometer fails to register the full force of the uterine contractions, unless a tight vagina gives the bag support. It is open to the same objection as is Schatz' method, in that a foreign body is introduced

within the uterus which might have some influence upon uterine contractions. That such influence is slight, is realized when one thinks of the time it usually takes to induce labor with a bag, especially before term.

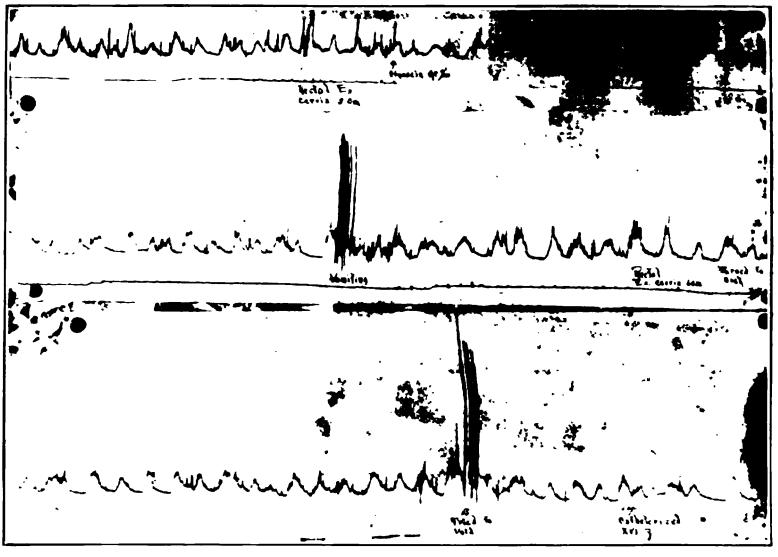

Fig. 1.—Hyoscine, gr. 1/100, administered at point indicated by arrow. Note the comparative absence of voluntary effort after this time. The record shows the effect of vomiting in the middle of the second line, and the effect of attempting to void in the bottom line. Sixteen ounces of urine were removed with a catheter five pains later. The timer marks minutes, wherever it works, in this and all subsequent records.

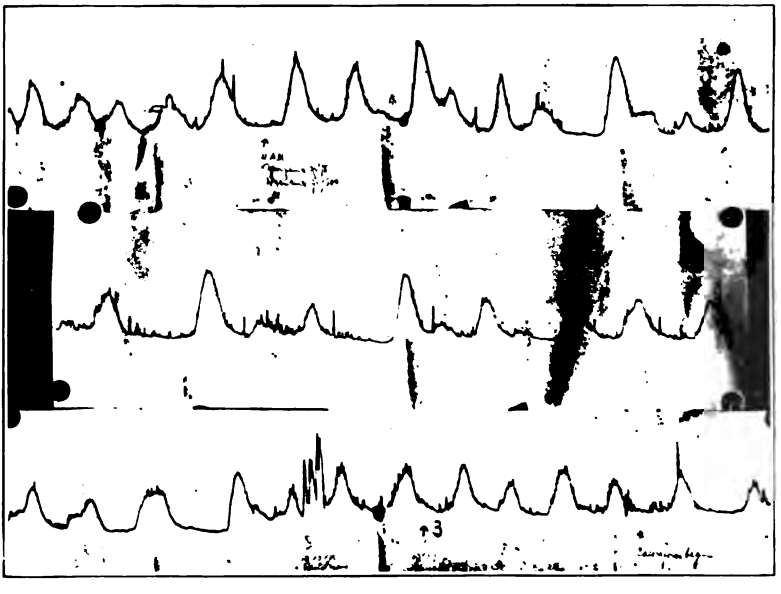

Fig. 2.—Morphine, gr. 1/8 and hyoscine gr. 1/100, were given at point in first line indicated by arrow. Note tendency to reduplication of pains. Chloroform was begun two pains before the record was stopped.

The chief advantage of this method is its simplicity. The introduction of a Voorhees bag within the cervix is often desirable and necessary upon clinical grounds. In order to observe what is taking place within the uterus, the stem of the bag is connected with a mercury manometer instead of clamping or tying it off, as is usually done. The only additional hardship imposed upon the patient is keeping her in bed. She can turn about, sit up, or use a bed pan without interfering with the working of the apparatus. There are some mechanical difficulties with the recording devices. For instance, when I used ink pencils and a continuous roll of paper, I had difficulty in keeping the timer working properly. On the other hand, when I used smoked paper on a long paper kymograph, the changing and smoking

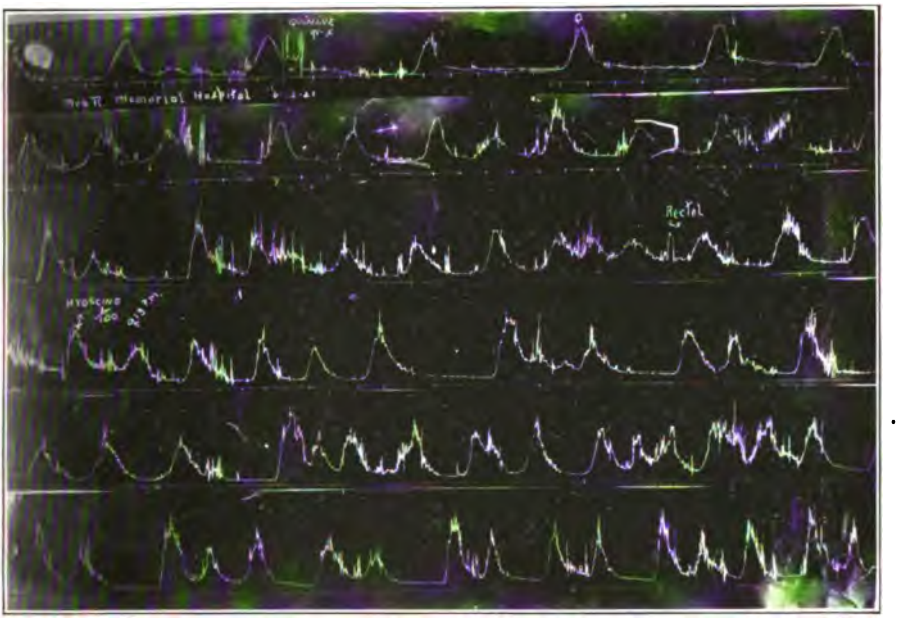

Fig. 3.—Quinine grs. 10, was given by mouth after the third pain of the first line. The effort of raising the shoulders to swallow the capsules shows on the record. There is an interval of 32 minutes between the first and second line, 75 minutes between the second and third, and 20 minutes between the fifth and sixth lines. Notice the relative smoothness of the contraction waves, after 1/100 gr. of hyoscine were given; at the apex of the second pain of the fourth line, and the reduplication of pains in the fifth and sixth lines.

of the paper made it necessary that I be near the physiological laboratory.

At first it was thought that the cumbersome recording apparatus might alarm the patients; but, on the contrary, they took great interest in watching the record and in comparing the force of each contraction with the preceding ones.

Although experimental apparatus was used, this work is not experimental in the same sense that a pharmacologist is able to demonstrate the action of drugs by animal experiments. My work was

merely observation with a more or less accurate method of recording the results. In other words, the patients received no different medication than they would have got had there been no recording apparatus. The only exception to this was when pituitrin and ergot were used and then there were extenuating circumstances. For instance, in two cases when a bag was placed on account of placenta previa before the period of viability, pituitrin was used; and once, in a full term multipara, two minims were used about the end of the first stage. Ergotol was used, in small doses, in two cases at term, once by mouth and once hypodermically. The fluid extract of ergot was used in two cases of antepartum bleeding at the sixth and the seventh month respectively.

Observations were made upon twenty-one patients. Hyoscine was used in ten cases, usually with an initial dose of morphine. Quinine

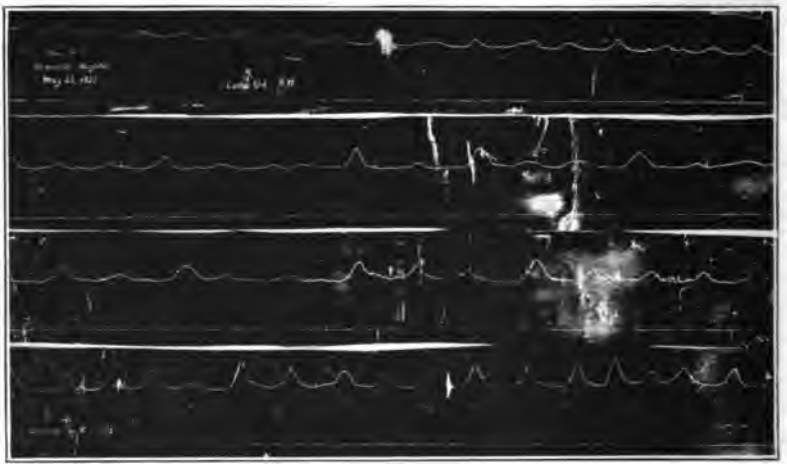

Fig. 4.—Castor oil, two ounces, was given at point *x* on the first line, and quinine, grs. 10, at the point *x* on the fourth line.

was used in six cases, twice hypodermically and five times by mouth; to one patient it was given both hypodermically and by mouth. Strychnine was used in one case; castor oil in one; ergotol in two cases, and the fluid extract of ergot in two cases. Pituitrin was used in three cases, twice alone and once following hyoscine. Two patients were given first quinine and later hyoscine.

Hyoscine.—There were ten patients in this group with a total of fourteen observations. Seven of these patients were given an initial dose of morphine, either $\frac{1}{6}$ or $\frac{1}{8}$ grain; two patients had quinine previously. Some received scopolamin dissolved in 10 per cent mannite, the so-called "scopolamin, stable," and some received hyoscine or scopolamin in tablet form. I could see no difference in the action of the two preparations which is in keeping with the accepted views concerning the identity of hyoscine and scopolamin.

As you see from the hysterographs, there is no very marked effect from the administration of either $\frac{1}{200}$ or $\frac{1}{100}$ grain. In some of the patients, who were showing contractions of the voluntary muscles as indicated by the perpendicular lines superimposed on the broader uterine curves, the effect was to diminish these or do away with them entirely, so that the tracing became smoother, showing only uterine contractions and some respiratory waves. In addition to this there seemed to be a tendency towards doubling or reduplicating uterine contractions as if the uterine muscle were more responsive to irritants as the result of the action of the drug. Moreover, by measur-

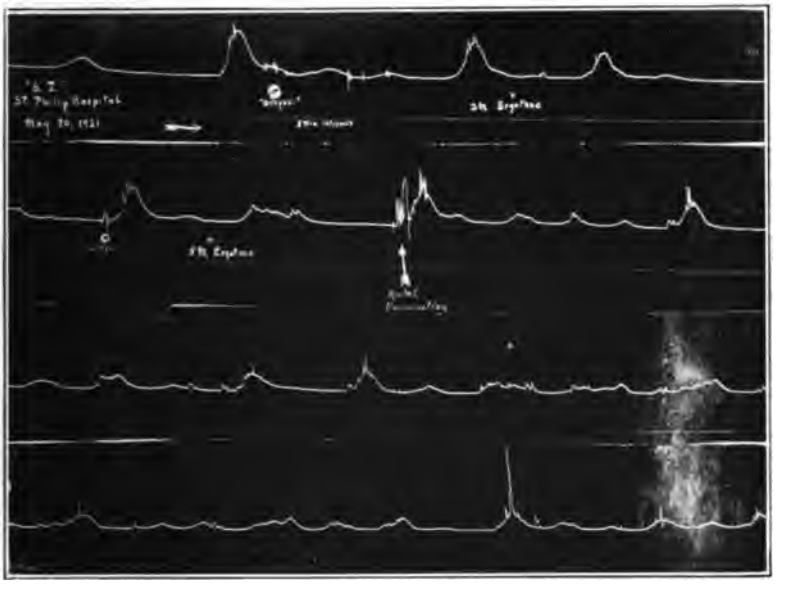

Fig. 5.—Ergotol, two minims, was given hypodermically at point *x* on the first line, and five minims at point *x* on the second line. The irregularities at *O* on the first and second lines are due to tying the stem of the bag tighter.

ing a given number, usually ten, of uterine contractions immediately before and after the hypodermic injection, it is apparent that the hyoscine had a definite, although slight additional effect. In twelve out of the fourteen instances, the height of the contractions was increased, while in two instances it was decreased. One of the patients in which the strength of the contractions was diminished had no preliminary dose of morphine and the diminution of the height of the contractions was due, in part at least, to a cessation of the voluntary efforts on the part of the patient. In nine instances the duration of the pains was increased, in four it was decreased, and in one it was unchanged. The rapidity of the pains is, more or less, dependent upon the duration of the individual contractions. In nine instances there was a decrease in the rapidity of the pains; once there was no

change, and once there was an increase in the rapidity of the pains. In two instances the timer was out of order so that this factor could not be determined accurately. These observations confirm the clinical impression that the first stage of labor is usually shortened by the use of scopolamin or hyoscine.

Quinine.—Six patients fall into this group. One patient was given 3 grains of quinine and urea-hydrobromide hypodermically; one was given four grains hypodermically, and later ten grains of the sulphate of quinine by mouth; four were given 10 grains of the sulphate orally. Of the two in whom quinine was administered hypodermically, one

Fig. 6.—Pituitrin, two minims, was given at point indicated by arrow. Labor in this case was induced prematurely. Note that while the action is slight, the uterus does not relax completely for nine minutes.

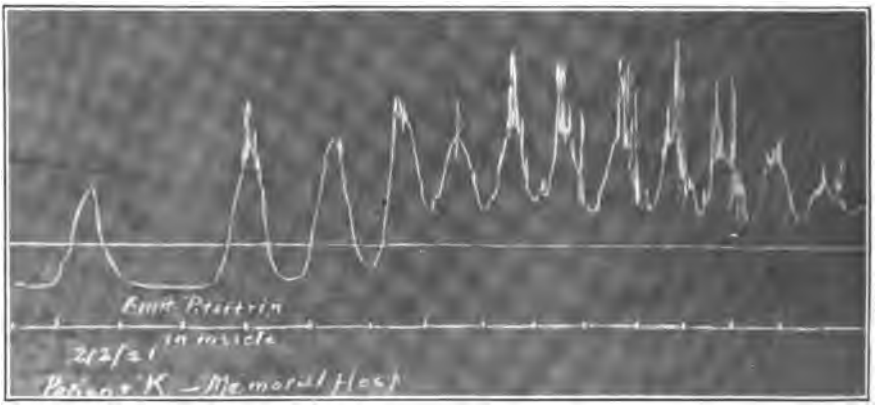

Fig. 7.—Pituitrin, two minims, was given at point *x*. The patient was at term. The uterus remained contracted 28 minutes.

showed a moderate increase and one a decrease in the height of the contractions. The latter showed an increase in the strength of the pains when quinine was administered orally. The length of the contractions was decreased in both instances after the hypodermic use of quinine, while the rapidity was increased in one and unchanged in another.

When quinine was given orally there was an increase in the strength of contractions four times, once quite marked, and once there was a decrease in the strength of contractions. The duration of the pains was increased once, unchanged once and decreased three times. The rapidity of contractions was increased twice, unchanged twice, and

diminished at once. From this rather limited series it would seem that quinine has, sometimes, a very marked effect in strengthening uterine contractions, but that its action is variable and that occasionally it has no effect. Its action seems to be more potent when given by the mouth than when administered hypodermically.

Strychnine.—In the single instance in which strychnine was used, 1/30 grain hypodermically, there was a moderate increase in both the strength and the duration of the pains.

Castor Oil.—Castor oil was given in one case. After the administration of two ounces orally, there seemed to be no effect on either the strength, the duration, or the rapidity of the pains.

Ergotol.—The baneful effects of the use of ergot preparations before the third stage of labor were so thoroughly drilled into me in my student days, that I hesitated to try it in the first stage. I was, however, so anxious to get a tracing to compare it with some pituitrin records I had made previously, that I, finally, ventured to use minute doses on an unmarried colored girl at term. At first two minims were given hypodermically with no appreciable effect. A five minim dose was then given, and it was followed by a slight increase in the rapidity of the pains with a lessening of their strength and duration. There was no evidence of tetanic contraction, unless the first contraction after the five minim dose be so considered, which seems scarcely justifiable. Another patient at term was given ten minims of ergotol by mouth with no appreciable effect. Of course, negative findings in two cases does not mean that ergotol has no action upon the pregnant uterus. A more plausible explanation of my results, is the inertness of the preparation used.

Ergot.—The fluid extract of ergot was administered to two patients. In both patients bags were placed on account of uterine hemorrhage. One patient was in her sixth month and the other in her seventh month of pregnancy. The latter was given twenty minims orally and later one dram. The former was given a single dose of one dram by mouth. In neither case was there appreciable effect. The same explanation probably holds good here as in the case of ergotol, although the pharmacist insists that I was using the best preparation obtainable.

Pituitary Extract.—The effect of pituitrin in three cases was discussed in a previous paper by Charles C. Haskell and myself;[4] but, as our tracings were not published, I will take the liberty of showing them at this time. In two of these cases labor was induced in the seventh month, while the third was at term. In all three an incomplete tetanus followed promptly upon the administration of from two to seven and one-half minims, occurring in four minutes in the premature cases and in two minutes in the full term patient. The contraction was maintained nine, thirty-five, and twenty-eight minutes, respectively.

The most marked effect followed the use of two minims in the patient at term, although it did not last quite so long as when seven and one-half minims were used in the premature labor.

CONCLUSIONS

The patient with a Voorhees bag in her cervix offers an excellent opportunity to observe the action upon the uterus of the drugs commonly used in obstetrics.

From my limited observations it would seem that hyoscine has a moderate, but rather constant, ecbolic action in the first stage of labor. The action of quinine is more variable; sometimes it markedly strengthens the normal rhythmic contractions and sometimes it shows no action whatever.

My observations upon the action of strychnine, castor oil, ergotol, and the fluid extract of ergot, are too limited to warrant even a tentative conclusion. It would seem, however, that the possibility of an inert preparation of ergotol and the fluid extract of ergot is a real one.

In the three cases in which pituitrin was used, even in minute doses, there was a continued contraction of the uterus that varied from nine to thirty-five minutes in duration. This is probably the explanation of the many disasters that have followed its use.

REFERENCES

(1) Arch f. Gynäk., iii, 1872, p. 58. (2) Arch. f. Gynäk., 1898, lv, 129. (3) Arch. f. Gynäk., 1920, cxii, 459. (4) Jr. Am. Med. Assn., May 21, 1921, lxxvi, 1390.

DISCUSSION

DR. GORDON K. DICKINSON, JERSEY CITY, N. J.—In a paper which I recently read I quoted from Robertson's "Biochemistry," in which he stated that the colostrum had the same effect as pituitrin. It would be well if Dr. Rucker could verify that in some of his future experiments.

DR. ARTHUR H. BILL, CLEVELAND, OHIO.—I have been much interested in this problem for some time. In the last six months, an identical series of experiments have been carried on in the Cleveland Maternity Hospital by Dr. F. S. Mowry. There is not time to discuss in detail the findings of these experiments, but I wish to emphasize the fact that experiments of this kind are extremely valuable. We have observed clinically the effect of these drugs, but to have a very accurate picture of just what they will do in labor should prove of much value to us in practice.

DR. RUCKER, (closing).—I am indebted to Dr. Dickinson for his suggestion. In the action of the ergot the interesting thing would be to see whether the ergot is properly tested, and whether it is carried to absorption. I think we are led to put more dependence in ergot than it deserves. If it does not produce uterine contractions, why use it?

A METHOD OF DELIVERY IN NORMAL CASES

By Magnus A. Tate, M.D., F.A.C.S., Cincinnati, O.

THE average duration of a normal case of labor varies from sixteen to twenty hours in the primipara and from ten to sixteen hours in the multipara. If by aiding Nature's efforts, we can materially cut the time without harm to mother or child and make the labor less painful, we are benefiting womankind.

All obstetricians are familiar with the uncertain nagging pains accompanying the often drawn out first, and the intense suffering incident to the second stage of labor.

You are also familiar with the frequent statement of some women: "I have never been well since the birth of my baby," and we know that this is due, not alone to unrepaired lacerations, but more frequently to the long drawn out first stage of labor, followed by an agonizing second stage, which leads to physical exhaustion and, in turn, is often followed by a peculiar syndrome of the neuroses. This is manifestly too true when we encounter those cases of badly managed malpositions in elderly primipara with a slight narrowing of pelvic diameters, who are allowed to drag through a harrowing labor; as well as in those cases of hysterical and frightened primipara and neglected dry labors. Such cases you see as consultants, or as staff members of our charitable hospitals.

Many are the remedies advocated to alleviate the pains of labor. We know that most of them have been discarded with the exception of the various anesthetics, morphia and chloral.

Advancement in the obstetric art is not so much in the selection of some method of delivery, as in the adoption of prenatal care and the observance of rigid asepsis.

We follow out methods of delivery as given to us by our forefathers, because, mechanically, their deductions were usually correct.

Skill is paramount to success, and the advent of asepsis has given us a leeway and freedom to attempt much that, in the past, was not advisable or wise.

Accouchement forcé has met with unfortunate results because of forcible dilatation of the cervix followed by the immediate and rapid delivery of the child. There is no doubt that it has been the means of saving some lives, especially when dealing with desperate conditions, such as hemorrhage, eclampsia, edema of the lungs, and noncompensating hearts.

Accouchement forcé is a major operation. The forcible dilatation

of a firmly closed os and rapid delivery of the child must, necessarily, be followed by a high maternal and fetal mortality. The dilating of an unobliterated cervix, other than by instrumental means, is a most difficult task. Forcible dilatation is rarely practiced today. It is comparatively easy to open up a soft dilatable cervix by the Harris method.

I give much credit to Potter for demonstrating and emphasizing that a vagina can be effectively dilated without injury to vaginal and muscular structures by the ironing-out process.

CASE 1.—Mrs.————, a refined and cultured woman, multipara, aged twenty-six. Her first labor occurred at the age of twenty-two, and was twenty hours in duration; normal presentation; instrumental delivery; perineal laceration requiring two stitches. The second labor, at the age of twenty-four, was eighteen hours in duration; twin birth; perineal laceration requiring two stitches. A slow recovery occurred in both deliveries. The following year she was subjected to an appendectomy. Third labor, age twenty-six. Knowing so well of the protracted recoveries of her previous labors, and of the appendectomy one year ago, I determined to try a method of delivery that I had been contemplating for some time.

The patient entered the Good Samaritan Hospital with the os dilated to the size of a silver half dollar. She was in the best of spirits, having regular, easily bearable pains, ten minutes apart. She was prepared obstetrically and taken to the delivery room at 10:00 P.M. Ether was administered to the surgical degree; the bladder was catheterized, and the specimen sent to the laboratory. The gloved hand, anointed with sterilized vaseline, was then introduced in the vagina, one finger at a time, following the ironing-out method. The thin and easily dilatable os and vagina were thoroughly stretched by 10:30 P.M. Anesthesia was withdrawn at 10:32 P.M. The patient was allowed to recover partially from the anesthetic by 10:40 P.M. One-half of one c.c. of pituitrin was now given, and the membranes ruptured. Regular pains ensued shortly. The patient was in a drowsy state and did not seem to suffer much. The child was delivered at 11:10 P.M., just one hour and ten minutes after the patient's entrance into the delivery room. The child weighed eight pounds. There were no lacerations.

This patient could hardly realize, thinking of her two previous labors, that she had actually been delivered within one hour and ten minutes. The following day, after a good night's rest, she showed no signs of exhaustion, and described her condition as follows: "I feel like I had had some slight vaginal operation, and while I am sore, I have not the same feeling that I had with my other labors."

CASE 2.—The patient entered the Bethesda Hospital, giving the history of having had the membranes ruptured at 8 A.M. I saw her at 9 A.M. The os was not dilated sufficiently. The pains were easily bearable. Examination at 10.40 A.M. showed the os dilated to the size of a silver half dollar, and one hand presenting. The patient was taken to the delivery room at 11 A.M. She was anesthetized at 11:30 A.M. The hand was replaced. Dilatation of the os was complete at 11:50 A.M. The patient was partially out from under the anesthetic by 12:05 P.M. One-half of one c.c. of pituitrin was given. Pains were not efficient. Pituitrin was repeated at 12:25 P.M. Rapid delivery followed at 12:35 P.M. Perineal tear, requiring three stitches. The time between entering the room and complete delivery was one hour and thirty-five minutes. That afternoon the patient's condition was very different from one who had gone through the ordinary labor. In this case the second dose of pituitrin was, probably, given too hurriedly; otherwise, I do not believe that there would have

been a laceration. In two cases patients did not seem to be susceptible to the action of pituitrin, so forceps were applied after waiting one hour.

CASE 3.—Patient's first labor lasted four days, midwife attending. She was rushed to a hospital and delivered instrumentally. The baby lived six days. It weighed nine pounds and six ounces. The mother was profoundly exhausted, ran a septic temperature for three weeks, and at no time did she have mammary secretion. The pelvic soft structures were like parchment, simply dried out and tore readily. The extensive lacerations of both cervix and perineum were repaired. This patient's second labor occurred under my care in the hospital. She was delivered in two hours and forty minutes. There was no perineal tear, but one side of the cervix tore, which was immediately repaired. No exhaustion, mammary secretion normal; baby weighed nine pounds.

Another case I have had was that of a hypersensitive, hysterical, neurasthenic patient. She was crying, tossing about, and "knew that she was going to die." She refused to obey any instructions or commands. She was delivered in two hours and forty minutes.

This was one of the cases where forceps were used to lift the head over the perineum. I am sure you will agree with me, that this kind of case requires much patience, tact, and ingenuity.

Another case, that of a young negress, primipara, aged eighteen, I saw with a young physician at my solicitation. Delivery was effected in one hour and forty-five minutes. The child weighed seven pounds and four ounces.

In a later case, that of a young primipara, aged twenty-one, weighing 100 pounds, there was a very bad mitral lesion. She had been under her physician's care for a period of two years. This patient was delivered in one hour and fifty minutes. No laceration, no exhaustion, and recovery was uneventful. The child weighed six pounds and six ounces. Other cases, so far attended, were uneventful, all having been delivered with safety to mother and child.

I do not report the number of cases delivered to date; they are entirely too few to be of value from a statistical standpoint. I have had, however, a sufficient number of cases to convince me that there is merit in this method of delivery. One case, a multipara (daughter of a physician), was delivered in fifty-five minutes. There were no lacerations.

SUMMARY OF METHOD

1. Patient must be in labor, cervix obliterated, and os dilated to at least the size of a silver half dollar. 2. Surgical anesthesia. 3. Bladder catheterization. 4. Complete manual dilatation of the vagina and cervix. 5. Patient allowed to regain partial consciousness. 6. Pituitrin one-half c.c., to be repeated once if the pains are not efficient in half an hour. 7. Membranes ruptured. 8. Management of delivery of child as in usual case.

Remarks: I am taking it for granted that all physical findings, the presentation and position of the viable child have been made and recorded; that the patient has been obstetrically prepared, and that postpartum findings are also recorded; otherwise no comparison can be made as to the merits of various methods of delivery. Deep anes-

thesia is requisite to procure proper relaxation; but the anesthesia must not be continued beyond a certain point. An anesthetic, at this time, is safer; the woman being in a happier frame of mind than if given later when she is disturbed, apprehensive as to the outcome, or frenzied with pain. Gentleness, dilating both vagina and cervix (with a clock before your eyes), is essential to good results. Do not rupture the membranes until the patient is partially rational and a hypodermic of pituitrin has been given, as the bulging of the membranes aids materially in keeping the os stretched to it fullest degree. The membranes often rupture spontaneously, after complete dilatation, with the first pain, following Nature's efforts, as they are no longer a functionating object.

I have found that the patient will have far better and more regular pains if we wait until she has partially recovered from under the anesthetic before administering pituitrin. Patients in this half drowsy state will respond to your commands and aid delivery by using the voluntary muscles. If pains become too severe, she may need a few whiffs of the anesthetic, especially when the head is approaching and passing over the perineum.

Episiotomy may be performed if necessary, but it is usually not required if proper dilatation of the vagina has been accomplished.

Delivery is not always painless, but can be made almost so, judging from observation and the statements of patients. The shortening of the time of labor is very advantageous from all standpoints, and of remarkable benefit to the woman. If dilatation be complete, lacerations should not be more frequent than in ordinary cases.

It is assumed that in the giving of pituitrin obstetric judgment will be used, for its injudicious use is apt to be followed by serious injury to mother and child. Unfortunately there is not, at present, an exact standardization of dosage of pituitrin. Various manufacturers have given us ampules of different strength; for instance, Armour's and Burroughs Wellcome & Co. pituitrin preparations are said to be more powerful in action than that of Parke, Davis and Co. If the patient be completely under the anesthetic, it will, naturally, require a larger dose to obtain the desired results. When we stop for a moment and consider the vast number of cases in which pituitrin has been used, we find very few reports of uterine rupture and death of child. If we analyze these cases, as I have tried to do, we will find one of three things. First, the case was one in which the drug should never have been used; secondly, the dosage was too large or repeated too often, or given when the patient was deeply anesthetized; thirdly, the patient was in an exhausted or septic state.

Puerperal complications and delayed convalescence, usually, have a starting point—shock, incident to mental and physical suffering.

What obstetrician has not had it brought home to him that an exhausted woman is a good subject for septic infection? What a different picture, and what a different history, is the physically well woman who rallies immediately after labor, to that of the worn-out and exhausted patient, who may run the typical febrile course. A long drawn out labor, accompanied by a hot, dry, swollen vagina, offers a fertile field for infection, and it only requires a study of governmental and health board statistics to verify the statement that exhausting labor is the prime factor of high and unnecessary mortality.

This method is not presented with the idea of supplanting well known means of delivery, as demanded when dealing with malpositions, operative conditions, or with any form of placenta previa; but it is applicable to that type, classified under the head of normal presentations, when the delivery is conducted in a hospital or in the better class of homes. I present this method to you for your earnest consideration, suggestions, criticism, or approval.

DISCUSSION

DR. IRVING W. POTTER, BUFFALO, NEW YORK.—Times have certainly changed. Who ever thought, five years ago, that Dr. Tate of Cincinnati would be giving me credit for anything; and yet, today, he gave me credit for dilating the vagina; and then he goes on and messes up a beautiful labor case. Now Dr. Tate has been to Buffalo; but he didn't stay long enough to learn anything. He reminds me very much of that story of the bull in the china shop,—what he didn't spoil by breaking, he messed up, and that's the way he handled this case. Who ever heard of a patient going under an anesthetic and then waking up, being given a dose of pituitrin, and given an anesthetic again? From the very start we have tried to keep away from dilating the cervix. We have dilated and ironed out the vaginal tract with very gratifying results, but we never dilated the cervix. And why, when he had a cervix he could put his hand in, did he not go on and complete the work quickly by version instead of taking an hour and fifteen minutes to do it?

In my experience it is very dangerous teaching to advocate the use of pituitrin while the child is in the uterus. Reports of bad results have come from all over the country, and that is what we have tried to avoid. We have dilated the vaginal tract and delivered the baby; and, after the baby has left the uterus, we have given the pituitrin. After a few years Dr. Tate will do differently. He will come around to treating his cases in a clean manner. If you dilate the vaginal tract there is no occasion for an episiotomy in any case. I have never done an episiotomy in my life and would not know how to do one; but to allow a patient to have an anesthetic, then let her come out, then give her pituitrin, I do not see the necessity for such a procedure.

I am pleased to have heard this paper because it means that Dr. Tate is coming around to the point where he believes there is some discomfort to the woman in the second stage of labor. I think the first stage is very easy to manage, but it is the long drawn-out second stage that he is trying to get rid of and that we are trying to get rid of, and we feel that we have succeeded better without pituitrin and without the anesthetic by doing a clean version at the end of the first stage of labor.

DR. ARTHUR H. BILL, CLEVELAND, OHIO.—It is very hard for me to discuss a paper when I totally disagree with what has been said. Nevertheless I am afraid

that is the case in the present instance. I am in hearty sympathy with anything which tends to make labor easy, but one thing I have always contended is that we should not interfere with the first stage of labor. If the pain is relieved, patients may be allowed to go through the first stage, and in the majority of cases, the head will pass spontaneously through the os. Let the first stage of labor alone and relieve the pain, no matter how long it takes. I am sorry to have Dr. Tate put the patient on a time limit basis. I think that is wrong. Ordinarily, the length of the first stage makes little difference, if the patient is comfortable.

In regard to the second stage of labor, I shall have something more to say in my paper. I wish to go on record as opposed to the use of pituitrin when the baby is in the uterus. I do not believe that all the accidents resulting from its use have been reported, including damage to the baby. We can get along without it. Whenever possible, let Nature take her course during the first stage of labor.

DR. M. PIERCE RUCKER, RICHMOND, VIRGINIA.—I agree with Dr. Bill that pituitrin is a dangerous drug. We have tried it on animals and, if you get any action at all, you get an incomplete tetanus of the uterus. I have tried it on three patients and have confirmed Dr. Haskell's experiments satisfactorily. In the tetanic contraction what are you doing? You interfere with the circulation in the uterus and produce suffocation of the baby in a great many of the cases. I went over the records of the Memorial Hospital and found the infant mortality twice that in pituitrin cases to those in which it was not given, regardless of the operators. Of course, it sometimes was not used properly, but it is mighty poor comfort to explain to the mother, who has a dead baby, by saying that she was too much exhausted, or something like that. You are just inviting trouble by giving pituitrin before the baby is out of the uterus.

DR. HENRY SCHWARZ, ST. LOUIS, MISSOURI.—I had no intention of participating in the discussion, but I cannot sit quiet and have men tell us that the use of pituitary preparations is as dangerous as they want to make us believe. It is true that you should not use pituitary preparations until you know what platform you stand on. When we, in 1912, tried all the various preparations of pituitrin in the market, when we used Armour's, Burroughs Wellcome & Company's and Parke, Davis & Company's preparations, and others, we did find exactly what you state. Armour's and Burroughs Wellcome's were twice as active as the others. We likewise found out that we must not use teaspoonful doses, cubic centimeter doses, but that we must be careful and approach the case slowly, with two or three minims at a time if need be. We found that we did not get tetanus of the uterus when it was used in that way, and the great advantage of it is that it causes contractions of the uterus which come and go, unless it is used by men who do not know how to handle it. It was first used by us, or we were one of the first, in cesarean sections because in this operation we were always afraid of hemorrhage when we had to open the uterus at a time when the woman was not in labor. In those days we usually had to wait until the woman went into labor before we could operate. Since the advent of the pituitary preparations we select our time for the operation and we have every assurance that we are safe. In the majority of operations, when we give the full dose of a pituitary preparation of some kind, we can be sure the uterus will contract on delivery of the child.

Again, we have proved, not on ten or twenty, but on hundreds of cases, that there is nothing more valuable than pituitary preparations before the baby is born. After the baby is born we want the tetanic contractions so that the uterus does not relapse and accumulate blood and create after-pains; but before the baby is born, we want the intermittent contractions. We have used it on untold cases; and they are all on record, and you are invited to come to Barnes Hospital and look at any

of our case records. There are a few thousand of them, and you will find that, in the majority of them pituitary preparations have been used. You will find that in some emergency calls to the home of patients who have had several children, and who are of relaxed habit, babies are born without the assistance of the doctor; but quite often there is hemorrhage; at times inversion of the uterus. In cases in which one can feel the head in the pelvis with the membranes still intact and the cervix open, that the patient may go into labor almost at any moment, we ask them to come to the hospital and then at 7 o'clock in the morning we give them castor oil; that makes them very prone to go into labor; but to make sure of it we give them four to five minims of Armour's or Burroughs Wellcome's pituitary preparation. A doctor and a nurse remain at the bedside, and sometimes a little massage is necessary, but we keep up the pituitrin, give it every few hours in cases of relaxed habit, so as to obtain relief, avoid the danger of hemorrhage, and prevent severe after-pains which are common if the case is left to Nature. As soon as the baby is born we administer a dose of some preparation of ergot to secure tetanic contractions of the uterus.

DR. TATE, (closing).—I do not do a version on normal cases because it is wrong and I do not believe it is good obstetrics.

As to the danger of pituitrin, I have written to the various manufacturers about pituitrin, have read the literature as thoroughly as possible, have had personal experience, have tried to analyze the various papers on pituitrin; and why some few physicians will not use it, calling it a dangerous drug is beyond me. You would not say you would not use cocaine or ether because once in a while you had a death from it. I consulted Professor Jackson of the Cincinnati University as to the properties and danger of pituitrin, and he said there was no danger at all if a man understood how to use it. That is the ground which I take. The recent books on therapeutics tell you that there is no danger from pituitrin up to 1 c.c., but I never give even 1 c.c., but do give one-third to one-half of a c.c. and never repeat it but once. I have not had a death of a mother and not a death of a child so far, and cases that were from fourteen to twenty hours from the beginning of the labor pains, go three, five or six hours. The gratitude of patients is enough to make me continue this method. Within the next few years I will present my results in case reports. All that I ask is, if you have a normal case, not an abnormal one, try this method and when you have tried it and have seen how beautifully it works, and how grateful the patient is, how the hours of pain are done away with, I think you will agree with me that there is merit in it.

THE CHOICE OF METHODS FOR MAKING LABOR EASY

By Arthur H. Bill, M.D., F.A.C.S., Cleveland, Ohio

IT IS very gratifying to note the efforts put forth by those interested in obstetric progress, which aim at the elimination, as far as possible, of the terrors of childbirth. The contrast between present-day methods of conducting labor and those of ten years ago is most striking. The old plan of allowing nature to take its course, even in the face of abnormalities, with the hope that eventually the abnormality might correct itself, has given way to a far more scientific and humane method of correcting abnormal conditions, and thus assisting natural forces which act best when conditions are normal. We find also a tremendous difference of opinion as regards the relief of pain. Even those who most strongly opposed the use of anesthetics and analgesics have taken their stand with those who are exerting every effort to make the labor as comfortable as possible for the patient. All these efforts are worthy of commendation, and yet we must acknowledge the danger of overstepping the limits of safety when these efforts are misdirected or when unsafe methods are used. The object of this paper is to attempt to discriminate between the safer and more conservative, and the radical methods, and to select ways of relieving the pain and the exhaustion resulting from labor to the last degree, and at the same time, keep within the limits of safety.

Emphasis should be laid upon the fact that fads and hobbies have no place in obstetric practice. Let us remember that both for the relief of pain and for the termination of labor, there are several methods; that there are, perhaps, points in favor of most of these methods in individual cases; and, on the other hand, there are contraindications to them in others. Bearing this in mind, it would seem that the obstetrician, who would do the best for his patient, will familiarize himself with all of the better methods and select them according to the case in hand, and not allow himself to apply one method to all cases, regardless of the varying conditions which surround them. My efforts have been directed toward such a selection of methods and, naturally, what is to be said in this paper is based on the results of these efforts.

The problem of making labor easy divides itself naturally into two distinct parts: (a) The relief of pain, and (b) the shortening of the second stage, or the working stage, of labor.

(a) There are two general groups of methods of relieving labor pains: analgesia and anesthesia. Analgesia adapts itself only to the

first stage of labor; anesthesia to the second stage. The latter is also useful in the first stage in multiparae, and as a supplement to analgesia in the first stage in primiparae. After trying various methods of analgesia, the writer has found the morphine and scopolamine method the most satisfactory, and uses it according to the usual prescribed method of small and frequently repeated doses. The one rule, which is strictly adhered to, is that no scopolamine be given in the second stage of labor, and not within a period of three or preferably four hours of the expected birth. This rule practically eliminates its use in multiparae, and in those occasional primiparae who have very short labors, with the latter exception, the method is used as a routine in primiparae. It has been found to be perfectly safe when the above mentioned time limit is carefully observed. In multiparae and the small proportion of primiparae mentioned, the general anesthetic is used instead. The time for beginning the anesthetic or analgesic is determined by one fact, namely, the suffering of the patient. In other words, something is given for the relief of pain just as soon as the patient seems to be feeling uncomfortable, no matter how early in labor. If the scopolamine and morphine method does not appear to give sufficient relief, a general anesthetic is also given with each pain.

Of the general anesthetics commonly used, we have ether, nitrous oxide, and chloroform. All will relieve pain with equal satisfaction, although there is a difference in their safety and practicability. In our practice, chloroform is not used, not that chloroform will not give the necessary relief, which of course, it will, but because it is a far more dangerous anesthetic than the others, and gives no better results. Ether is the usual anesthetic used because of its entire practicability and safety, and the fact that it gives better relaxation, which is an important factor at the time of delivery. Nitrous oxide is used in selected cases. Aside from the fact that many patients find it more agreeable, it has one advantage in the earlier part of labor, when the pains are not very forcible, in not inhibiting the pain quite as much as ether. The latter advantage is only seen in an occasional case, however, and is best illustrated in induction of labor, in which it is our custom to use gas. This, however, is a disadvantage at the end of labor. Ether is not given by the drop method, for in the relief of a labor pain the best results come from giving a large amount in a short time. The closed cone is used as a routine. The second stage is one of general anesthesia. Morphine, scopolamine, ether and nitrous oxide are all used in our practice, the choice being made in each individual case at the time of labor and, except for following the general principles laid down, no definite choice is made in advance. Each method has its advantages and disadvantages in certain cases. In some cases, all are used.

(b) Shortening of labor. I am in hearty sympathy with the principle of shortening labor instead of allowing the patient to carry it on to completion by her own efforts. However, in following this plan, great caution must be urged. First of all let me emphasize the fact that efforts toward the shortening of labor should, as a rule, be limited to the second stage of labor. The first stage should not be interrupted unless there is a definite indication resulting from the condition of the mother, or, more often, the failure of the fetal heart. By a combination of analgesia and anesthesia, it is possible to allow the patient to complete the dilatation of the cervix with little suffering in a very large percentage of cases. It has been my practice for a number of years to shorten the second stage of labor by delivering the patient under complete anesthesia, and of correcting abnormalities of position when the patient has reached the second stage. The method used has depended upon the individual case being a forceps delivery or a version, according to the circumstances surrounding it. No decision as to the method of delivery is ever made in advance; for by doing so, the interests of the patient are not served as well as by going to the delivery with an open mind and deciding each case on its merits.

To give an idea of the results of this selection of methods of anesthesia and of delivery, I present the last 500 cases which I have personally delivered previous to September 1st, 1921, as follows:

Ether alone in	228	cases
Morphine and scopolamine, plus ether, in	192	"
Morphine and scopolamine, plus nitrous oxide in	19	"
Nitrous oxide and ether in	56	"
Nitrous oxide alone in	5	"

The methods of delivery were as follows:

High forceps	41,	inc. posterior positions conv. by forceps	32
Medium forceps	81	" " " " " "	40
Low forceps	236	" " " " " "	6
Podalic versions	71	" posterior positions	52
Breech extractions	19		130
Abdominal cesarean sections	26		
Vaginal cesarean sections	3		
Pubiotomies	3		
Craniotomy	1		
Spontaneous Births	19		
	500		

The fetal mortality in cases delivered after the sixth month of pregnancy was:

1. *Stillborn.* Nine or 1.8 per cent. Two macerated, on one of which craniotomy was performed. Three after high forceps, 1 toxemia case in which labor had been induced. One after version. Three after low forceps, after prolonged and difficult

labor. Of those living and viable at onset of labor—seven, or 1.4 per cent were stillborn.

2. *Died in First Two Weeks,* Seven or 1.4 per cent. One delivered by medium forceps in case of toxemia, died during first 24 hours. No autopsy. One 6½ months' premature, lived one day. Two died suddenly on first and second days. Autopsy revealed nothing but greatly enlarged thymus in each case. One 7½ months premature with double harelip and cleft palate, lived 3 days. One anencephalic monster, lived but a few hours. One hemorrhagic baby. Autopsy showed intestines and peritoneal cavity filled with blood.

In the combined list, there were eight babies, or 1.6 per cent that died during or after the labor, and as a result of the labor. Three of these, namely, the high forceps cases, very likely, should have been delivered by cesarean section. In the case of the other five, it is not clear how the labor should have been conducted differently.

It will be noted that in 336, or 67.2 per cent of the cases presented, the head passed spontaneously through the external os while the patient was under the influence of analgesia or anesthesia. This large percentage emphasizes the success of the policy of relieving the pain, and allowing the case to take its own course to the point when the head is well within the pelvis; and, if possible, entirely through the cervical canal, unless there are indications to the contrary. To analyze the cases further, it is well to divide them into groups: (1) Those cases in which the head was at the pelvic outlet, or well within the pelvis and in a normal anterior position. (2) Those cases in which the head lay in a vertex occipitoposterior position. (3) Cases in which the head was either in the pelvic brim or above the brim at the time of delivery, and the pelvic measurements were ample. (4) The cases of breech presentation. (5) The second child in case of twin birth.

(1) There were 271 cases in this class. Many of these would in time have resulted in spontaneous births. However, the policy followed was that of delivering them with forceps under complete anesthesia, a procedure sometimes called the prophylactic forceps operation. Experience has shown that there are several advantages in this procedure: (a) The strength of the mother is saved, and her suffering diminished. (b) The danger to the child from prolonged pressure upon its head is decreased. (c) The number and extent of lacerations of the perineum are diminished. (d) Asepsis is better maintained than when the patient is thrashing about. Preliminary manual dilatation of the birth canal, which is always performed, very materially lessens the pressure to which the child's head is subjected at the end of labor, while the complete relaxation of the patient allows the obstetrician to control the birth of the head far better than when the patient is bearing down, and it is necessary to use considerable strength to hold the head back. The delivery in such cases is simple, and very little traction force is necessary. The degree of success depends upon the care and accuracy

with which the forceps are used. In their use, especial stress is laid upon the following simple rules: (a) Always make an accurate cephalic application. (b) Use axis traction so that the head will follow the course which corresponds to that of the normal mechanism of labor. In this connection I would urge the more common use of axis traction forceps, even when the head is low, for with their use, there is greater accuracy than when the ordinary forceps are used with Pajot's maneuver. (c) Take far more time than is usually allowed for the delivery, that there may be an extremely gradual birth. (d) Try to see how little force may be expended in traction. (e) Promote flexion of the head. (f) Take the forceps off and shell the head out manually as soon as the chin may be felt posterior to the perineum. While it has been my practice for some years to routinely lift the head over the perineum with forceps, I have hesitated to advocate this procedure for fear of its abuse. However, the satisfactory results would seem to indicate that greater stress be laid upon the proper use of forceps, and less upon their disuse because of damage not uncommonly resulting from careless forceps work.

(2) The occipitoposterior position. This is by far the most frequent complication of obstetric practice, and causes a large percentage of the prolonged, painful and difficult labors. In the list of cases presented, there were 130 occipitoposterior positions, or 26 per cent. In many cases the head will rotate to an anterior position spontaneously, if the labor is allowed to go on, but only after an unnecessary prolongation, amounting to many hours in some cases. Under such conditions, the patient is working under a very severe handicap, in that the head does not tend to follow the path of the normal mechanism of labor. Much suffering and exhaustion therefore results. It is the writer's policy not to wait for the spontaneous rotation, but to correct the abnormality, when there is complete dilatation of the cervix. If the head is in the pelvic cavity, this is accomplished by rotating it with forceps, using the modified Scanzoni procedure, which I have previously described before this Society. Traction is never made upon a head in an abnormal position, such as the occipitoposterior position. After the head is rotated, we have no more of a serious problem than in the cases in Group 1.

If the head is in the pelvic brim, or above it, and in a posterior position, the choice of procedure lies between the high forceps and podalic version. In the list presented, there were 84 such cases; in 52 of them version was performed, and in 32 the forceps were used to rotate and to deliver. In my experience, both procedures have their advantage in suitable cases, and the choice between them is made at the time of delivery. To illustrate: If the membranes are intact, and the patient is a multipara, the podalic version is invariably used. If the mem-

branes have ruptured, the uterus dry and somewhat tonically contracted, I prefer to rotate and deliver with forceps. Further, if the patient is a primipara with unusually rigid soft parts, the forceps delivery has the advantage that far more time may be allowed for the delivery than is possible in the case of a breech extraction. This must materially lessen the dangers to the child and the extent of laceration to the mother. This group comprises those cases in which the head is held up at the pelvic brim solely on account of the posterior position, cases in which the head would have readily descended into the pelvis had the position been normal.

(3) Exclusive of cases in which there is an occipitoposterior position, the head may remain at the pelvic brim even though measurements are good, for example, face presentation, brow presentation, presentation of one parietal bone, and cases in which there are insufficient or misdirected pains. For the delivery of such cases, podalic version is to be preferred. In the cases of the malpositions mentioned, forceps are contraindicated; they should never be used unless an accurate application is possible, and the head can be made to descend in the manner in which it descends in conformity to the normal mechanism of labor. This is not possible in the case of the abnormal positions mentioned.

(4) Breech presentation, especially the frank breech. Too often the patient is allowed to continue for a long period in the second stage of labor in the hope that the breech will descend spontaneously. The patient may be entirely relieved of this unnecessary prolongation of labor, and nothing is to be gained by waiting for spontaneous descent. The preferable plan is to bring down the feet and extract without further delay when dilatation is complete.

(5) In twin births, the second child is immediately delivered by version. There is no excuse for the long interval sometimes occurring between the births of twins. The conditions are never more ideal for version than in the case of the second twin.

It will be noted that in the list of cases presented, there were only nine high forceps cases if we exclude the occipitoposterior positions. These were cases in which there was a moderate dystocia and indications for delivery were present. Every effort is made to reduce the use of high forceps in such cases to a minimum.

Any plan of shortening labor may be abused. The abuse lies chiefly in too early attempts at delivery. From my own experience, and from observation of the work of others, I believe that the one great cause of failure may be attributed to the cervix; that is, attempts at delivery are made when the cervix is not completely obliterated. Its resistance may be the cause of disastrous results, whether version is performed or whether forceps are used. Manual dilatation of an undi-

lated cervix is often insufficient. Hence, the stress which I have laid upon the importance of waiting whenever possible for the head to pass through the cervical canal, or at least for the complete obliteration of the cervix.

It is possible to so simplify labor that women will not look forward to it with dread. The part which the patient takes in labor is largely a passive one, consisting chiefly of breathing the anesthetic as directed. She is seldom urged to strain or pull. Pulling straps are never used. The results of our efforts as described, as shown by the relatively low fetal mortality, furnish ample justification of these methods. The conservation of strength is a great benefit to the patient during the puerperium, while the apparent lack of fear with which they anticipate labor, materially lessens the common nervous symptoms of pregnancy including nausea and vomiting.

In conclusion, let us remember that all obstetric cases are not alike, that neither the same method of anesthesia nor the same method of delivery offers the best solution for every case. We have various methods and most of them have their peculiar advantages for individual patients. Let us become proficient in each, and be ready to use the one which best applies to the case in hand.

DISCUSSION

DR. IRVING W. POTTER, BUFFALO, NEW YORK.—Some few years ago Dr. Bill came to Buffalo to see me and I met him. I said, "Dr. Bill, I have nothing to show you today but, according to the law of averages, I will have something before long." He said, "Very well, I'll wait and see." I left him at the hotel. He called me up shortly afterward and said he was going home. Naturally, I was surprised and have been a little bit chagrined at Dr. Bill's opposition to my methods and I wanted to overcome that opposition. I wanted to keep Bill up all night (laughter). That night I had five cases and Bill could have gone home and slept the next day just as well (laughter). I would have taken Bill that night and I would have waited until the cervix was dilated, and I would have ironed out the vaginal tract, carefully under chloroform anesthesia, we use chloroform altogether and are not afraid of it; I have one man who gives it all the time—and I would have used it in this case. Then, when the patient was asleep and the cervix dilated fully, I would have introduced my hand into that uterus and grabbed Bill by both feet, allowing his body to come through the pelvis with his buttocks in the hollow of the sacrum, delivering his anterior arm first, then rotating the posterior arm under the arch and I would have put my two fingers in his mouth and delivered his head through the vulva, at this time gently milking from his throat the mucus that he had attempted to swallow. I would have lifted his well flexed head over the perineum and Bill would not have seen the light of day, but noticed how easy it was to do away with the second stage of labor, and how he could do it just as well as I.

I agree with Dr. Bill that there should be no fads or fancies in obstetrics, but I insist that the use of chloroform is not a fad or fancy. My records prove this. There should be no hurry. Not long ago I kept a woman three days after rupture of the membranes, and then I delivered her of a normal child without injury to her whatsoever.

The occipitoposterior positions occur, he tells you, in about 27 per cent of the

cases. I find them in about 60 per cent. But that does not make any difference. The tissues of the primipara seem to stretch and dilate easier than those of the multipara.

In the past year I have delivered 1130 women. My fetal mortality is now about what I have been striving for, 2.3 per cent. We use chloroform; we do versions; we do not use pituitrin until after the baby is out of the uterus. We do not use pituitrin in cesarean sections until after the uterus is closed. There is no occasion for giving it before. Give it after the uterus is closed and you will have no trouble. That is what version does; it obliterates the second stage. Five years ago there was much discussion on this point. There was no shock then to these labors, and many of them lasted a week. Now we hear from many sources about eliminating the shock of the second stage. Five years ago Dr. Schwarz used to go to sleep. He told me himself that as long as the woman was groaning regularly he could snore easily. (Laughter.) Now, all is different, and we are each of us trying to relieve all the shock and suffering possible by shortening the duration of labor without injury to the mother and child.

DR. E. GUSTAV ZINKE, CINCINNATI, OHIO.—I think it is well in this connection to read a letter which I received in response to sending a volume of Transactions to our Honorable Fellow, Sir J. Halliday Croom of Edinburgh, Scotland.

"Dear Dr. Zinke,

I have to acknowledge, with my most grateful thanks, your kindness in sending to me the valuable volume of Transactions. Every volume you send me, I peruse with the greatest care and infinite advantage. Particular interest in the present volume, amongst many others, is in the paper of Dr. Irving W. Potter on Version—this is to me, most interesting because Sir James Simpson, my teacher and my predecessor in my chair, told me of a similar experience on the question of version which occurred in the practice of a Doctor Figge in the village of Bathgate where the famous Sir James Simpson was born. Doctor Figge had a large colliery practice and with a view of saving his time and relieving the patient of an infinite amount of suffering, he invariably performed the operation of version when it was possible. He was a country practitioner and laid no claim to science, but his success in his work was extraordinary, so Sir James Simpson told me. The paper which Dr. Potter had contributed to the Transactions, is, to me intensely interesting.

Nothing is impossible to you American gentlemen, but how any human being can attend 1100 cases of midwifery in one year and survive to tell the tale is beyond my Scotch comprehension. Dr. Potter's paper is a most interesting one in every way and reveals an experience which must be absolutely unique—it is a wonderful record.

Believe me,

Most faithfully yours,

(Signed) J. Halliday Croom."

DR. JOHN NORVAL BELL, DETROIT, MICHIGAN.—On this subject I am quite in accord with Dr. Bill. I like his attitude in the whole matter, especially when he says that we should individualize, that we must not treat these cases all along a certain way. I believe Dr. Potter does a version in all of his cases, or in the vast majority of them. I believe that this is messing it up just as much as Dr. Tate messes it up in his way. I think there is a happy medium, and that is this: to relieve the woman of suffering and get her through the labor in the easiest manner possible. We can give the patient scopolamin and morphine in the first stage. We can ad-

minister just enough to keep her comfortable until the cervix has softened up and the patient is ready for delivery. Then, instead of doing as Dr. Tate does, which is a hard thing to do, though he speaks of its being easy, but I find it difficult—do as Dr. Bill does, wait until they are dilated and then do a version if you wish. But you can anesthetize the patient, and, I think, Dr. Potter has taught us that in this way you can dilate the vagina very nicely with the gloved hand and green soap, and go ahead and deliver the child. Why do a version and get all tangled up with the cord? That is what the version usually means—not in the hands of Dr. Potter because he knows how. My method is to give the patients scopolamin and morphine up to the time the cervix is softened, then give ether, use the forceps, deliver the baby, and the patient is comfortable and happy.

DR. ARTHUR H. BILL, (closing).—Dr. Potter says that if I had stayed in Buffalo and seen all those cases, I would have changed my mind. It would not have changed my mind one iota. I know that he can do versions. We can all do versions. Version is all right in its place. There are cases in which version is advantageous and others in which other methods have greater advantage. There is no question in my mind but that the head will come down spontaneously, as I have reported in 65 or 70 per cent of the cases, in which it will either reach the pelvic floor or pass through the cervix. Thus there will be many cases in which we simply have to lift the head over the perineum, and this is so much simpler and gives so much less disturbance that it appeals to one. So far as the patient's suffering is concerned, there is no difference. The patient is relieved of pain and knows nothing about the birth in either procedure. The question under consideration is the method by which we are to deliver the baby. We are aiming at the same thing in regard to saving the patient pain, but I wish to emphasize the fact that we should choose only those methods of delivery which seem best adapted to the case in hand. I think the obstetrician should familiarize himself with all methods so that he may avail himself of the method that is best suited to the particular case.

TEN YEARS OF PAINLESS CHILDBIRTH

By George Clark Mosher, A.M., M.D., F.A.C.S., Kansas City, Mo.

AT THE meeting of the British Medical Association at Birmingham, 1890, I was much impressed by an anecdote related by Alexander Simpson of Edinburgh, nephew of Sir James Y. Simpson, who in a paper on the "Management of Labor," told of a mistake made in the early years of his practice. Called to a woman in labor at some distance from his home, he found the patient having very weak pains and with evidence which he interpreted as indicating a slow delivery. Leaving several pills of ergot with directions to give one every hour until good labor had set in, he remounted his horse and returned home. On changing his clothes for dinner he found on emptying his pockets that the vial supposed to be pills of ergot did not contain ergot but pills of opium instead. Hastily returning to the house of the patient to prevent the giving of more opium he was astonished to find that the woman had fallen into a refreshing sleep after the first pill and, upon awakening, she began good hard pains which soon terminated the case. This experience set him to thinking, and he tried the experiment on subsequent occasions and usually with happy results.

On returning to America on consideration of the subject of the relief of pain in labor it occurred to the writer to try some expedient to accomplish this result since so frequently one is implored by the patient in the agony of her suffering to give her something to relieve her of pain.

To the average man the subject of pain in childbirth is a trivial matter and not longer ago than the present summer distinguished gentlemen, who are obstetricians, went on record as opposed to all drugs in labor.

Dr. Wakefield recently said that "the greatest outrage of modern civilization is the fact that, in spite of all that is recorded in medical literature, the profession and the public remain in silent acquiescence and have no regard for the suffering of women in childbirth, or make any attempt to alleviate this agony."

The twentieth century woman has by education and environment, developed into an extreme type of hypersensitiveness; she is possessed of a nervous system susceptible to impressions and feels pain more acutely; hence her physical and mental forces are easily depleted. The result is, as a general rule, she suffers under ordinary circumstances "a lack of the feeling of well-being which constitutes

good health." Consequently, when she goes into labor, the modern woman cannot produce efficient efforts, either mental or physical.

Let us consider that 20,000 women annually die from childbirth in the United States, that hundreds of thousands more are incapacitated by invalidism due to the same causes. A melancholy picture! In the chairman's address in the Section on Obstetrics of the American Medical Association, Dr. John O. Polak, 1920, disclosed the fact that the death rate in obstetrics has increased from 1901 to 1919 and this in spite of all improved hospital technic. This fact must be recognized as a reflection on the general care of women in labor. The statistics of the hospitals bear out this conclusion. As both morbidity and mortality in hospital cases are lessened, we must in some way improve the method of obstetric care of the average woman in the home to lower the mortality rate of the country at large.

In what particular is this easier than to increase her own immunity by conservation of her reserve, simply by lessening pain, fatigue, shock and exhaustion?

The effect of suffering in labor demoralizes the nervous and vital forces to such a degree that it demands recognition and cooperation.

When one studies the statistics of the alarming decrease in the size of the families in this country in the last 40 years and the alarming increase in abortion, as shown by Arthur E. Meyer in the August number of this journal, we must conclude that some reason exists for the desire to escape maternity on the part of the American women. The maternal instinct is strong in the normal woman, and there is a reason for the record of our childless homes, aside from the oft quoted "high cost of living." Every family indulges in luxuries, and even if babies were to be classed among the articles subject to war tax, people would not reject them simply because of the cost. The great bugaboo of the young wife is the fear of the suffering she must endure in giving birth to a child.

What a pity that motherhood, which is the most beautiful relation in life, should be attended by physical suffering and mental terror, when this condition may be avoided by a safe and comparatively simple method of treatment. If we are able to give assurance that pain can be lessened or prevented by any combination of drugs, which may be used without injury, we bestow a boon on our patient; we gain her confidence; later, gratitude follows her having gone through the valley of the shadow without a memory of any disturbing character.

It is but fair to state, at the outset, that the views following are based on my own experience and where they differ from those of other men, they are to be taken as drawn from cases in our own clinic.

Various methods of combination of drugs have been devised by the few investigators interested in the study of relief of pain; some of

these having value, others being without virtue. As observation of one or another of these plans demonstrates to us its weak points, it has been dropped after more or less trial. For example, the tablet of hyoscine-morphine-cactin, which, after a vogue of several years has fallen into disuse, was early discovered to profoundly affect the child, and that in a most dangerous manner. This we at once discarded after a single trial. The deep narcosis of all large doses of morphine and hyoscine, or morphine and atropin was subject to the same serious objection. Scopolamin and morphine we first used in 1911, and we feel it met the indication; but the objections to it on the part of the profession have been so general, that it but slowly came into any considerable favor. It must be remembered that profound narcosis will, in greater or less degree, prevent uterine contractions, hence it is not possible to prevent pain absolutely and continuously throughout the labor.

Gauss early showed that there is a point in amnesia which falls between a simple temporary relief from pain, and absolute narcosis. This happy medium has been graphically styled, "Twilight Sleep." This term has been the subject of much opprobrium because it was formerly exploited in a popular way in articles printed in magazines for consumption by the lay public.

I believe the specific effect of the administration of scopolamin is of the greatest benefit in women of the highly organized nervous system of the cultured class. But in our experience the point at which this condition of amnesia appears is vastly different in different individuals, and must, therefore, correspond to the individual sensibility in order to avoid overdosing or fail, because of too small an amount being administered. In this individualization, as demonstrated in our own cases with the same results that have been conclusively shown by Dr. Gauss, the undesirable effect of extreme pain on the one hand, and deep narcosis on the other, are overcome.

The technic proposed by Siegel, of experimental fixed dosage, resulted in undesirable developments which I had already encountered in our early attempts to establish a fixed dosage for all patients. The sensibility of the patient is the only measure of the degree of narcosis and this can be ascertained only by observation of each patient as to the results of her treatment. If Siegel's method of the so-called "simplified amnesia" could be followed, the personal equation might be eliminated, and the care of the patient left to an intelligent nurse, except at the time of delivery; and one of the chief objections to scopolamin—the demand on the time of the physician—be thus removed. Siegel changed his technic three times; but in each method the large initial dose of scopolamin and repeated doses of narcophin of generous amount, was, to our mind, a fatal mistake. Siegel, also,

in his last series, used amnesin, a combination of quinine with narcophin, for the purpose of stimulating the labor pains which are, admittedly, reduced by the large doses of scopolamin and morphine. Whether quinine will be effectual in combination with an opiate, in overcoming the reduction of the expulsive force of labor, is a question. In the individualized method this "amnesin" is unnecessary. I am not yet ready to report whether quinine will be helpful in overcoming the occasional state of excitement due to the scopolamin.

In a most elaborate study of the opium alkaloids by Dr. D. I. Macht, of the Department of Pharmacology of Johns Hopkins, as reported in the Journal of the American Medical Association and the American Journal of Medical Sciences, he demonstrates that pantopon (pantopon hydrochlorate first devised by Sahli, at the University of Zurich, 1909, which includes the chlorides of the total alkaloids of opium) acts as a stimulant to the respiratory center, and thereby obviates the objection to which morphine has been subject. All of the criticism to the use of scopolamin and morphine in labor is centered on the fetal asphyxia which followed the use of this combination in the former dosage.

The comparison of Sahli's mixture of the total alkaloids, with the administration of morphine alone, shows a remarkable result; two mgs. of morphine completely paralyzed the respiratory center in a rabbit weighing 1000 grams, while in a rabbit weighing 900 grams after 14 mgs. of the total alkaloids of pantopon, equal to 7 mgs. of anhydrous morphine, the rabbit still responded to inhalations of CO_2. Sahli's mixture of opium has the experimental value of being safe to be used in several times the amount of morphine that could be tolerated alone, and the result is more prompt and efficient; also being much less depressant. For several years it has been recognized that the great objection to morphine is the depressant sedative effect on the respiratory center. Codein, though to a less degree, has the same general effect.

The accumulation of morphine is, in our opinion, the greatest menace to the life of the fetus, as it has been shown that, while scopolamin passing into the body of the child is eliminated by the urine in twenty minutes, morphine is not so easily eliminated. We have, therefore, following these experimental discoveries coincident with our own clinical experience, in the great majority of cases, discontinued the morphine entirely, as we believe the great danger of the combination is in the use of this opiate, and morphine has practically been abandoned in favor of pantopon in our work.

We find that the other objections to morphine, nausea, vomiting, constipation, suppression of urine, and distention, are less pronounced after pantopon than morphine. However, after some experience in administration we have in our later work found it has been unnecessary

to use even with the initial dose of scopolamin in many cases the pantopon. For many years we have used no opiate after the first dose. Of course, the individual cases where pantopon can be eliminated are carefully selected, the equable stable mental organization inviting the use of scopolamin alone, as these patients bear pain and respond without the necessity of the sedative before the analgesia. In other words, our personal experience has induced changes in the original detail of the administration of scopolamin, as observation demonstrates how the individual patient must be treated, rather that a fixed dose should be given to each patient, as suggested by Siegel in his experimental system, styled "the simplified method."

The question of the length of labor under scopolamin we have settled to our own satisfaction. We find that the first stage is less than in cases without the injection. The softening of the cervix in primiparae proceeds more readily than in other cases where it is not used. And this is one of the most grateful of the benefits resulting. In the second stage the duration is slightly lengthened. The average duration of labor in these cases is 10 hours and 49 minutes; in primiparae 13 hours and 20 minutes; in multigravida 7 hours 10 minutes.

We have frequently found the expulsion of the fetus expedited by ⅓ ampule of pituitrin hypodermically administered in those cases where delay is met as the head reaches the perineum and a degree of inertia prevents the forward movement of the child. The necessity for an increase in the use of forceps, is acknowledged; but with full dilatation and the head on the perineum, no harm can result from skillful application of forceps; proper care being observed to do extraction between pains, to remove forceps before the head is entirely extruded, and by pressure from below in the anal region to push the head gently through the outlet. The third stage of labor is somewhat prolonged, doubtless due to reaction after the relief from the burden of the labor ending with the expulsion of the child.

We are now trying out the procedure of giving ½ c.c. of pituitrin immediately following the expulsion of the fetus as a means of expediting the delivery of the placenta. Much of the shock, experienced in labor, is due to hurrying the placental stage before the afterbirth separates from its site in the uterine wall. As an index we clamp the cord with a hemostat at the vulva, the suggestion of Tweedy, and await the dropping of this barometer two and one-half inches before making any effort to expel the placenta. Our invariable rule is to avoid traction upon the cord, or the misapplied Credé of violent pushing against the abdomen to express the placenta.

In 1820 Charles D. Meigs said, "Show me a case of postpartum hemorrhage and I will show you a case of mismanagement of the third stage of labor." After a hundred years we are inclined to vote with

Meigs on this conclusion. At any rate, waiting for the placenta to be at the outlet, will, in the average case, diminish the tendency to postpartum shock, as well as postpartum hemorrhage. Our custom is to have the patient closely watched for two hours, cautioning the nurse as to rapid pulse, abdominal distention and free hemorrhage. We have no more tendency to hemorrhage in scopolamin cases than in those where it is not used.

All of our patients are delivered in the hospital, so that there has been no opportunity to compare the results of hospital managed cases with those confined at home. However, as there is an admitted psychic element in the success of the treatment, it would seem that an attempt to utilize this method in the bedroom of the patient at home might be disappointing, as she will be subject to disturbances from her environment. Ideal conditions in the hospital must be insured, such as absolute quiet in the delivery room and vigilant supervision on the part of the attendant. Cotton in the ears includes both suggestion and some degree of preventing disturbance by outside sounds. Since the patient in complete amnesia is likely to be unaware of the progress of the delivery, she must be watched for precipitate delivery, which is liable to occur if there is neglect of this precaution.

I believe much of the success of our method is due to using a reliable stable solution in ampules instead of the ordinary hypodermic tablet of commerce. Formerly we used a $\frac{1}{100}$ grain dose; but more recently we have depended on the $\frac{1}{200}$ grain ampule alone. Our average case has had $3\frac{1}{2}$ ampules, the largest number 12 ampules; 12 per cent of our cases have had but one ampule. Cases delivered within two hours do not respond to scopolamin and these rapid deliveries are done under ether alone, if sufficient evidence is found to base an estimate of the probable length of the labor.

Since a large number of our cases are referred, and many of these are toxemic, we have not used the gas-oxygen anesthesia. Dr. Edward P. Davis, and other observers, believe this combination of anesthesia to be dangerous in cases of maternal toxemia. While many reports are given of admirable results from those clinics where gas is used, our results have not tempted us to change our method of amnesia.

The great aim in better obstetrics is twofold; it concerns mother and child, both as to morbidity and mortality. Fortunately, the interests of the two are most frequently identical, the argument as to the mother, I have attempted to make clear. As to the child, a glance at the comparative statistics must prove conclusive, as they are most striking. Williams, of Johns Hopkins, reports a fetal mortality of 7 per cent, and Slemmons, in California, had 5 per cent, which is about the average infant death rate. Gauss, at the Freiburg Clinic, has in his last report of 500 scopolamin cases a fetal mortality of 1.89 per cent,

and Polak, Brooklyn, in a series of 500 cases, reported a mortality of 4 infants, or less than 1 per cent. We have had no fetal death that could be charged to the scopolamin treatment. The fetal mortality from all causes in our last 500 cases, excluding prematurity, is 2.8 per cent. In contrast to our former experience is the fact that it has not been found necessary to tub a single scopolamin baby. Some children show an oligopnea; but none of the last series had apnea, and there were none that did not recover the respiratory rhythm after a few minutes, without more effort than allowing the mucus to be expelled from the mouth by suspending the child by the feet for a few minutes. We have, of course, no maternal mortality chargeable to scopolamin.

While no one can say what might have been the result in any case had the patient not been given scopolamin, we can only judge of the results in the aggregate of experiences compared with those delivered with this method, and those under other conditions. For instance, take the problem of occiput posterior positions of the vertex with which, unfortunately, all obstetricians are familiar. It is an axiom that given plenty of time, over 90 per cent of these cases will rotate spontaneously to an occipito anterior position; but, who has not made out the position without examination under these circumstances, by the incessant appeals for relief of pain in the back; the patient, finally, becoming exhausted by the long and tedious process of labor. These cases are admirably met by scopolamin, and the average patient comes through with a pulse under 100, and in a few hours recovers sufficiently to be asking for food.

It is only necessary to compare our experience in these cases alone, to be able to draw conclusions as to the degree of exhaustion suffered in cases with and without scopolamin. By and large our patients average a shorter convalescence and we are able to send them home earlier than under the old methods. Even in our City Hospital cases, although scopolamin has not been so satisfactory, we long ago abandoned any set day of convalescence as an indication of discharge, each woman being dismissed when the fundus of the uterus is at the symphysis and the lochia, for 48 hours, has shown no red color. In some patients this will be as early as the eighth day; ordinarily the average is the twelfth, instead of the fourteenth day, as formerly.

We find scopolamin to be of value in heart conditions, toxemia, rigid cervix, and contracted pelvis of minor degree; as the relief from agonizing pain allows for a lessening of the tension, both physical and mental, the patient recuperates for the further effort she must make for her delivery. The result is that shock is diminished, the head is more easily moulded, and the tendency to perineal laceration is diminished.

The claim that scopolamin produces a better milk supply, we have

not been able to substantiate. On general principles, the less exhausted the mother the better her nursing capacity; but the question of any specific relation is still open, and must be determined by further investigation.

It is a matter of interest that in so large a degree, even the men who have not been favorably disposed toward scopolamin as an amnesic in their work, have used morphine and hyoscin, or morphine and atropin, or morphine and scopolamin, as an analgesic antecedent to an inhalation anesthetic. Various observers report between 50 and 70 per cent of perfect amnesia. In 70 per cent of our patients we have had complete amnesia. The outstanding fact, claimed by Crile, in his anoci-association in general surgery, is that, in a sense, the area of nervous irritability is blocked and the agonizing pain of the patient is thus relieved. This is the secret of the amnesia of scopolamin.

CONCLUSIONS

1. Scopolamin is both safe and efficient if intelligently managed.
2. In primiparae it is invaluable, as the moulding and rotation of the head are encouraged by its influence.
3. The technic of Gauss must be followed to insure the greatest measure of success, rather than the "simplified method" of Siegel.
4. A shortening of the time in the first stage of labor results.
5. The second stage is doubtless somewhat extended. The forceps or pituitrin may be needed at the end of the second stage of labor.
6. Patients must be constantly watched for precipitate delivery.
7. No increase in postpartum hemorrhage has occurred in our cases.
8. Shock and fatigue are diminished.
9. Perineal lacerations are greatly reduced in degree and in frequency.
10. Fetal mortality is lessened.
11. Lactation is not affected.
12. Mothers are up earlier and in more nearly physiologic convalescence than in our cases where scopolamin was not used.

DISCUSSION

DR. WILLIAM H. CONDIT, MINNEAPOLIS, MINNESOTA.—Every new measure or method brought before the profession has gone through three stages: introduction, exploitation, and conservative application. It appears as though we were in the stage of exploitation of the methods for relief of the pain of childbirth. We cannot teach the students these extreme methods, from hypnotism to the Potter operation. We employ methods which we think strike a happy medium; treat every case for delivery as a law unto herself and use morphine when indicated. We are happy with our results from gas, with an apparatus that permits the use of ether, if necessary. We do use pituitrin, but never in more than five minim doses. We get short second stages and the patients come through with good results—we think,

better statistical results—in the end. Why not take this happy middle ground instead of accepting some ground that we cannot feel absolutely sure of?

I was surprised to hear that Dr. Bill is not using nitrous oxid. We get very good results and never think of using chloroform.

DR. ROLAND E. SKEEL, LOS ANGELES, CAL.—Purely as a side issue Dr. Mosher's paper has brought out an interesting point in that he has abandoned morphine in favor of pantopon.

Shortly after Sahli made his observations upon the difference in the therapeutic effects of morphine and the combined hydrochloric acid soluble alkaloids of opium, we started on a series of clinical experiments to ascertain which was the more valuable as a surgical narcotic, inasmuch as opium had an undoubted stimulating effect upon the heart which morphine did not have. This was done by giving morphine and pantopon alternately to every operative case regardless of the nature of the operation or character of the anesthetic, and it was found that the patients having pantopon not only were more comfortable than the morphine patients but that vomiting was materially lessened after the former. In laparotomies this worked out in about the proportion of one to three, that is three times as many vomiting attacks followed the use of morphine as followed the use of pantopon as the pre-and postanesthetic narcotic. Since that time pantopon-atropine instead of morphine-atropine has been used almost without exception and if those who believe in a mixed narcosis will follow this plan in their gynecologic patients I am confident these patients will suffer less shock and have a more comfortable convalescence with much less nausea and vomiting.

AN ANALYSIS OF THE POTTER VERSION

By Edward Speidel, M.D., Louisville, Ky.

IT IS not necessary to explain to the members of this Association or to any one who has kept in touch with obstetric literature, what is meant by the Potter method of version. Presented for the first time five years ago, and followed up each year with an additional paper on the same method, Dr. Potter has had the gratification of seeing intense antagonism and resentment change to unqualified admiration.

Potter presented his version as a method of delivery to be used practically in all cases, with the idea of relieving the parturient woman of the discomforts and delays of the second stage of labor. He presents no indications or contraindications for the use of the version and, consequently, leaves no opening for a discussion on that point.

Having had the pleasure of a visit with Dr. Potter in Buffalo, and from a limited experience with his method in private and hospital practice, the writer would like to discuss the version from three distinct points of excellence.

First: It is such a decided improvement over all the old established procedures that it should supplant every other method of performing podalic version. Second: The delivery of the child after the version has been performed is such a marked advance over the old methods of breech delivery that it should displace that practice at once. Third: His effective treatment of the child at birth by gentle rational manipulations, is so superior to the many rough treatments to which the asphyxiated baby has been subjected heretofore, that it should induce every obstetrician to emulate them.

The writer wishes accordingly to discuss the method from these standpoints without endorsing the object for which the author presents it.

The Potter method of version, fortunately, is not solely a hospital procedure. It is easier than the older method and can be readily performed by any one at all competent to do a version. A person with a small hand is by nature especially qualified to do a version. It can be performed in the humblest home. In fact the ordinary kitchen table makes the most ideal operating table for any of the ordinary obstetric operations. The patient's head is at one end of the table convenient for the anesthetist, while the hips are at the other end with the legs upon two chairs in the modified Walcher position, which is a feature of the technic. This position as is well known increases the true conjugate diameter about 1 cm. The vaginal outlet is drawn

so far down that the angle, formed by the long axis of the uterus with that of the vagina, is diminished and the uterovaginal canal becomes less curved, approaching more a straight line and making delivery much easier. It also relaxes the perineum and so lessens the liability to laceration of that structure. This position is superior to the lithotomy position as it relieves the patient of the intense backache that often follows vaginal operations when the legs have been held up, in an unnatural manner, for some time, with the lumbar spinal curve unsupported and the patient resting upon the sacrum with the weight of the two legs superimposed. It might be worth while to try this Walcher position in some of our gynecologic operations.

It is very essential that the cervix be fully dilated and, in primiparae, Potter not only waits for full dilatation but seems to prefer partial descent of the presenting part before proceeding with his version. I venture to say that he avoids manual dilatation in primiparae if possible. In normal dilatation the cervix stretches and retracts with each pain so that, when full dilatation is attained, the cervix is obliterated. In manual dilatation the cervical tissues are simply stretched to the sides of the pelvis; there is no thinning out or retraction, and this is the cervix that catches the neck of the fetus at the crucial point of the delivery and nullifies the object of the version.

Potter prefers chloroform as the anesthetic. Many of us who remember the period of twenty-five years and more ago, when chloroform was used almost exclusively in the south, and one ounce of this drug would hold a patient in deep anesthesia for an hour or more, cannot help wondering whether an inhalation of ½ pint or more of ether into the lungs is not more dangerous than the use of chloroform despite the findings of the anesthesia commission, that is supposed to have settled the question.

The patient is prepared as for a surgical operation, catheterized, shaved, and the parts cleansed externally with soap and water. Potter makes no mention of vaginal cleansing. Here I would like to present my own method of preparation, which I have always used in my obstetric operations. The vagina cannot be rendered sterile by letting a thin stream of bichloride or lysol solution trickle down its walls. Instead the gloved right hand of the operator holding a piece of gauze, saturated with green soap, should be used to thoroughly scrub the vagina and cervix, and this should be followed by a copious irrigation with sterile water.

In Potter's technic the right hand is not used internally throughout the precedure, consequently, it cannot contaminate the field after this preliminary cleansing. The left hand, covered with an elbow-length rubber glove, is well lubricated with green soap and introduced into the vagina. Green soap is an ideal lubricant for these passages as

it is easily washed away by the secretions that pass out during and after the version. Vaseline, which is generally used for this purpose, clings to the tissues and forms the best kind of an embedding material for microorganisms.

Potter then proceeds to iron out the vagina and distends it for easy delivery of the after-coming head. His method consists in pressing downward and backward on the posterior vaginal wall from the cervix to the introitus, first with one finger, then with two, three and finally four fingers, and seems to be an advance over that advocated by Edgar, in which the fingers are inserted into the vagina to make traction on the muscular sling of the perineum for the same purpose. The left hand is then introduced through the dilated cervix, between the unruptured membranes and the uterine wall to the fundus and gently swept around in all directions, avoiding the placental site.

This maneuver is similar to the practice in cesarean section and facilitates the delivery of the placenta. The bag of waters is so elastic and the uterus so relaxed under surgical anesthesia, that the fetal parts can be readily palpated and the location of the legs determined before rupturing the membranes. By palpating the neck of the fetus one can also determine whether it is encircled by the cord. The distinctive feature of the version proper now seems to be in no wise to disturb the relation of the fetal parts before the version is completed. In this way one avoids pressure upon and entanglements of the cord, undoubtedly the most disturbing factor in determining the favorable or unfavorable outcome of a version.

Potter performs all of his versions with his left hand. It is reasonable to suppose that others, not as dexterous, might perform the operation with either hand encased in elbow length gloves and, in performing the version, follow the old rule of using the hand so that the palmar surface of it will come in apposition to the abdomen of the child. At this juncture a towel is wrapped around the left arm of the operator to absorb the liquor amnii, that gushes out with the rupture of the membranes. It seems best to break through the membranes high up near the fundus and then slide the hand down the thighs of the fetus until the feet are reached. Gentle traction, with pressure on the head in the opposite direction, will aid in readily bringing both feet out of the vagina and completing the version.

It will be remembered that in the older methods it was always demanded that only one leg be brought through the cervix, in order that a wider surface be left to dilate the cervix. The facility with which delivery can be effected when both feet are brought down shows that the older procedure was faulty. The idea that a version is dangerous if some time has passed since the rupture of the membranes and, especially, if the head has descended into the pelvis, does not

hold good. The experienced obstetrician finds the uterus so relaxed and elastic under full surgical anesthesia that the head can be readily pushed up and the hand introduced for a version.

Only recently I performed a version in a head presentation bringing down both feet readily more than twenty-four hours after rupture of the bag of waters had taken place. With both feet protruding from the vagina, the final step in the procedure resolves itself into the delivery of a breech presentation. It is but fair to state that in the past, everyone has dreaded the delivery of the arms and after-coming head by the method in vogue up to recent times. The method described by Potter is so superior in every respect, that it should remove every dread of breech delivery. One need have but little trouble with the delivery of the after-coming arms, shoulders and head.

Potter makes gentle traction on the legs of the fetus, turning the back of the child up until the scapulae appear at the vulva. Then he slips a finger along the shoulder under the symphysis pubis and delivers the anterior arm. He then turns the body of the child in such a way that the posterior arm comes to rest under the symphysis pubis and delivers it in the same manner as the first shoulder. In all of my cases after delivery of the anterior arm, the posterior arm slipped out without any difficulty.

The crowning feature of the version is the delivery of the after-coming head. It is far superior to the Smellie-Veit method and is dependent solely upon the manipulations by the operator. Potter advises against following down the fundus during the delivery; because, he claims, one creates the very condition that we seek to prevent. By pushing down on the head it sinks between the shoulders and the arms go up. Whether Potter is correct in his view, I am not prepared to say. In all of my cases the arms seemed to have been carried upward, more or less, but this made not a particle of difference in the ease of delivery.

Potter delivers the head by inserting two fingers of the left hand into the baby's mouth, the body riding astride of his left arm and then, with the right hand resting upon a sterile towel, suprapubic pressure is made downward and backward until the face distends the vulva. The feet of the child are now held high up and its throat stroked to empty the trachea, and, in many instances, the fetus will begin to breathe while in this position.

There should be no haste in forcing out the rest of the head. Instead, it may be allowed to dilate the perineum and with the ironing-out of the vagina, practiced before beginning the version, many deliveries will be completed without a laceration. Potter shows no hurry in the delivery of the child for fear of having an asphyxiated infant; and after the birth of blue babies, he quietly places them on their

right side on the abdomen of the mother and allows respiration to start spontaneously. This position, of course, favors the closure of the foramen ovale. The umbilical cord is not tied until pulsation stops.

It will be remembered that the venous circulation in the cord ceases very shortly after birth in consequence of the contraction of the umbilical arteries; but the arterial circulation in the umbilical vein continues for from five to fifteen minutes adding, at least, an ounce of blood to the fetal circulation and supporting the heart of the fetus until respiration is established. It may be assumed that this is an important feature in the resuscitation.

Success seems to follow this gentle method in nearly every instance; that has been my experience. Potter's statistics show the same result. This goes to show that we can discard many of the rather rough manipulations that were practiced in the resuscitation of asphyxiated babies, without impairing our results.

In a discussion of this mode of the delivery, with Halstead of New York, it was suggested that the body of the child be allowed to come down, naturally, with the shoulders descending in the left oblique diameter at the superior strait until the scapulae appear at the vulva, then to rotate the anterior shoulder under the symphysis pubis and deliver as such. In order not to disturb the relation of the fetal parts, the posterior shoulder should then be lifted over the perineum. Theoretically, this should then leave the after-coming head in the right oblique diameter of the superior strait, consequently, the easiest delivery should be, downward pressure on the fundus with the head held in this diameter until the fingers in the baby's mouth press firmly upon the perineum, then rotation forward under the symphysis and the delivery completed as described by Potter. Potter with his enormous opportunities can quickly determine whether there is anything of value in these suggestions.

An ampule of pituitrin is injected as soon as the baby is born and serves to expedite the delivery of the placenta. It may be assumed that a uterus emptied by version, in ten to fifteen minutes, is more liable to sudden relaxation and postpartum hemorrhage than one that has emptied its contents by rhythmic contractions for an hour or more. Furthermore about 2⅓ ounces of blood are saved the mother, as has been determined by Ryder at the Sloane Hospital for Women in one hundred cases treated with pituitrin, in the third stage of labor.

With the experience gained through the Potter version the writer has solved the delivery of breech presentations for himself as follows: With full dilatation in a frank or complete breech or footling presentation, full surgical anesthesia, iron out the perineum, bring down both feet, and complete the delivery according to the Potter procedure.

Potter does not state his fetal mortality in normal cases in which he

has used his version solely for the purpose of relieving the patient of the discomforts of the second stage of labor. It is surely essential that those desiring to follow that indication for the use of this version should know this.

The writer has found the version of special service in cases with apparently normal diameters but a lack of progress in labor in spite of good pains. In such instances there is generally found premature ossification and, in consequence, nonmolding of the fetal head or an overdeveloped fetal head.

Only recently the writer delivered a woman, weighing 94 pounds, of a 9½ pound baby by the Potter version, without laceration of the soft parts, after a two hour ineffective second stage of labor.

DISCUSSION

DR. IRVING W. POTTER, BUFFALO, NEW YORK.—Dr. Speidel has discussed version from three standpoints without endorsing the procedure.

I wish he had taken another course and given his own personal experience with it and either advocated or condemned it. We know it can be performed in the house or hospital. We also know that a small hand and arm are better than a large hand and arm. We know that the position of the patient is of importance and that the modified Walcher position is the ideal one to employ. As for the anesthetic, we have concluded that chloroform is the best and see no reason to change. We use it because of the rapidity with which the patients recover and because of the complete relaxation which is necessary in doing a version.

Of course the cervix must be obliterated and the os dilated. We wait until the parts are ready, it makes no difference whether it is half an hour or three days, provided the woman is comfortable.

We have found green soap to be a splendid lubricant and a splendid cleansing agent for the vaginal canal. This makes the parturient tract about as sterile as it can be made in that length of time. With plenty of green soap and plenty of time to dilate the vaginal canal, the hand can be introduced into the vagina without any danger. Then the ironing out process is begun and version is started. I still maintain that the left hand is the proper one to use. In that way the right hand is left for outside work, and the doctor should school himself to use only one hand for the work in the uterus. When one hand has been introduced into the uterus it should not be withdrawn until the feet come along, in the average case.

There should be no time limit placed on this operation. The cord is not pulsating and has not since the baby has left the brim of the pelvis because there is pressure on it.

One of the effective points of this method consists in the delivery of the shoulders. As one of the shoulders rotates underneath the arch, the arm is being lifted up over the chest. The posterior shoulder is then brought forward by rotating the body. In that way you keep away from the rectum, avoid the tears which you formerly had, and, deliver both as anterior shoulders. What difference does it make whether the head rotates and comes through one or the other side of the pelvis? I think it is a mistake to deliver one shoulder posteriorly when it is the rectum we are trying to get away from. Another thing. These patients should not have an antepartum enema. If they do, you will have a liquid fecal matter distributed all over the field of operation, and that is wrong.

Now, who shall do versions? I do not believe the ordinary practitioner should

rush in and do versions, but I think the men who are properly trained can do versions with benefit to the mother and child. I do not advocate, and never have, that the man who is seeing scarlet fever and diphtheria, and such things, should go and put his hand up in the vagina and uterus just as if he was putting it in his pocket. That is not fair to the man, the woman, or the method. I have done version in a great many cases and I have widened the field for the application of version, and I believe that I have avoided many complications by this procedure.

I work in Buffalo in many different institutions as there is no institution large enough to contain all of it. That makes my work scattered, which is unfortunate. Statistics are not reliable in all of those places. If there was but one large institution where the work could be done under the supervision of a certain set of individuals, it would be ideal. Last year I delivered over 1130 women and over 900 of them were version cases. This compares favorably with the preceding year, in which 1113 were delivered. My fetal mortality was 2.3 per cent.

I have tried for five years to bring before you a method that would stand up under opposition, and I submit to you these results. They are the best so far that I have been able to produce.

DR. M. PIERCE RUCKER, RICHMOND, VIRGINIA.—I have the honor of being one of Dr. Potter's early disciples. I started doing version, principally, because it saved the mother pain, and I became more enthusiastic because it saved the mother's perineum, and I became more enthusiastic still when I realized that it saved the babies. Men who have inquired into the deaths of babies during the first days after birth, find that a large percentage have cerebral hemorrhage, which may or may not be the cause of the death but it is a pathologic condition. Of 481 babies, 21 have come to autopsy, only 2 have shown signs of intracranial hemorrhage. One premature baby lived a few hours and died with a large intracranial hemorrhage, which, I believe, was due to pituitrin. One case had a contracted pelvis and a prolapsed hand. I did a version but had to force the head through the pelvis by brute force; that baby had a cerebral hemorrhage. The other 19 babies came to autopsy from enlarged thymus and other conditions, not intracranial hemorrhage. I think we must take this point into consideration in choosing the method of delivery. I believe if you follow up the babies for a year, you will find that the babies after easy births far surpass in their chances of survival those that have difficult deliveries.

DR. LEE DORSETT, ST. LOUIS, MISSOURI.—I had the pleasure of spending a few days with Dr. Potter and on returning home took up his method of version in some of my cases. I have not done it as a routine method of delivery, but in certain selected cases it has worked admirably. In occipitoposterior positions I think that it is the only method of delivery. I do not think that the Scanzoni or similar procedures have any place. Unless every step in Dr. Potter's technic is followed the whole method will be a failure.

It is my opinion that chloroform is the only anesthetic to be used. Ether is much slower, more of the drug is necessary, and its elimination is much slower. In abdominal cesarean sections where the resuscitation of the child is often necessary I have always noted that there is a strong odor of ether on the child's breath for some time after its delivery.

In regard to "ironing out" the vagina, Dr. Potter does not "spring" the vagina with two fingers, as some other men have taught, but inserts the whole hand within the vagina and, usually, spends from five to ten minutes in the process of dilatation.

As to bringing down both feet during extraction of the child, it has been my experience that it is often difficult to grasp both feet at the same time, so that I

have been compelled to draw one foot through the cervix, then go after the other, and bring both through the vagina and vulva together.

In my work, so far, I have lost one baby in doing version. Looking back at this case now, I can readily see my mistake. The case was one of eclampsia in which labor was induced by the bag. As the patient was not doing well, having poor contractions and an alarmingly high blood pressure, I went through a partially dilated cervix and did a version; but the cervix contracted upon the after-coming head and the baby was lost.

I have been surprised when observing the perineum in the cases after delivery, to note how readily that structure "snapped" back in place. I have examined these cases from one to two months after delivery and in all of them the perineum was intact.

DR. O. H. SCHWARZ, ST. LOUIS, MO.—I have had the opportunity of seeing Dr. Potter at work in Buffalo, and there is no question that his method of version is admirable. If one is performing his version, it must be done in the minutest detail. I think doing it as a routine procedure is entirely wrong. One must remember that where conservative obstetrics is practiced, very admirable results are obtained.

I was very enthusiastic in employing version in cases of occipitoposterior positions, but before doing this I consulted the literature on the management of occipitoposterior cases. One of the first papers I consulted was that of Plass, published in 1916, in the Johns Hopkins Bulletin. The incidence of occipitoposterior position was 11½ per cent. He explains this low percentage by the fact that many cases were not examined until well in labor, and rotation had probably occurred in many instances. Operative interference was necessary in 22 per cent of 600 cases. The mortality was 4.02 per cent, including babies of 2500 grams and up. If we employ version in such cases, we must equal or better these figures.

We employ the Potter version in occipitoposterior positions in such cases where there is no progress within a reasonable time after full dilatation of the os. We use the method in preference to Scanzoni application and to application of forceps with the occiput transverse.

DR. ARTHUR H. BILL, CLEVELAND, OHIO.—Heretofore we have discussed the question of whether version is a proper routine procedure. This morning we are to discuss the method of delivery. It seems to me to be for the most part very commendable. One or two steps which, in the hands of the average man, give trouble have not been emphasized.

In the first place, in regard to the delivery of the shoulders, I would like to suggest a slight improvement. It has been our practice to deliver the anterior shoulder first, and I think that is the proper procedure. Instead of putting the fingers in and sweeping the hand down, it is our practice to grasp the baby by the body, with its back to the front, draw it downward and outward in a direction opposite to the shoulder to be delivered, at the same time making a rotary movement. What happens is that the arm meets the resistance of the pubic arch, and is thrown across the chest, the shoulder, and usually the entire arm, being delivered by this movement without inserting the fingers into the vagina at all. Then by the same movement downward and outward in the opposite direction, the other arm is delivered. The advantage is that you do not need to insert the fingers into the vagina, and no traction is made on the arm.

Now, about delivery of the after-coming head. It has been stated that it makes no difference through which diameter of the inlet the head passes. It certainly does make a difference. I believe that many babies are lost in version because of this mistake. When the baby is delivered with its back to the front, we are

drawing the occipitofrontal diameter of the child's head through the conjugate diameter of the inlet. The occipitofrontal diameter of the child's head in some cases is greater than the conjugate diameter of the pelvis, and hence there is difficulty in the extraction of the head. Before making traction on the child's head, if it lies in the anteroposterior diameter, rotate it to an oblique position, and then make traction; and, after it is through the inlet, internal rotation. Let the child's head follow the path it would follow in normal labor.

DR. SPEIDEL (closing discussion).—I am sorry to say I am not prepared as yet to follow in Dr. Potter's footsteps, by endorsing his version for every case. In a multipara with full dilatation of the os, who will easily deliver in fifteen or twenty minutes, with nitrous oxide or chloroform so there will be no discomfort in the second stage, I cannot see why such a baby should be turned, and the woman submitted to the risk of podalic version. I do say that there are indications for this version, and I cannot see why it should not be used in all face presentations. I think the majority of occipitoposterior positions should be delivered by version, and in breech presentations, the final steps should be as in the Potter version. I mentioned in my paper that the Potter version is easier than the old podalic version. But even in the hands of an expert this version is not easy. There is a decided nervous tension in such circumstances and none of us are absolutely sure that the baby is going to be born alive. The crucial point is the delivery of the after-coming shoulders and head; and Dr. Potter should be able to improve upon that.

I am glad Dr. Bill endorsed my suggestion that if the delivery is conducted according to the proper mechanism, this will make it easier. The shoulders should come down in the left oblique diameter, the head is then in the right oblique diameter and, consequently, it should be easier to deliver the shoulder and head in those diameters.

In regard to the indications: If it can be shown by postmortems that babies die of hemorrhage of the brain in normal deliveries because of a long-continued second stage of labor, then, of course, it is an indication for using this version; but if the hemorrhages only show themselves in abnormal cases it means that the version is indicated only in abnormal cases. Until you can show that these hemorrhages occur in normal cases, I am not prepared to follow Dr. Potter in using this version in normal delivery.

TREATMENT OF ECLAMPSIA; THEN AND NOW

By John F. Moran, M.D., Washington, D. C.

ECLAMPSIA and infection are the two great scourges of pregnancy, parturition, and the puerperium. While the latter, through the introduction of asepsis, has been robbed of much of its terror and placed well within the limits of prevention, the former, because of insufficient knowledge concerning its etiology and origin, is still involved in hypothesis and theory; its treatment largely empirical and its morbidity and mortality high. Much important work, however, has been accomplished in recent years, particularly, in its pathology, which, in supporting the toxic theory, is thus contributing to a more comprehensive knowledge of the disease. That various toxemias affect alike the pregnant and nonpregnant is obvious; but the trend of opinion favors the belief that there are one or more varieties dependent on the gravid state which are, probably, the underlying causes of eclampsia, hyperemesis gravidarum, acute yellow atrophy of the liver, and many of the minor ailments and psychoses of pregnancy.

Conformable to the various views held as to the origin of eclampsia, different methods of treatment have been resorted to; but the results have remained as uncertain as the theoretic foundations on which the methods have been based. So that, at the present time, we are, unfortunately, without a rational treatment with which to combat this dangerous complication of pregnancy; and, in the presence of severe types of the disease, are well nigh helpless. The graver forms comprise from 3 to 5 per cent of the cases in general; they are more frequent at different periods of gestation, and they may appear in groups. These malignant cases are frequently attended with few convulsions, coma quickly supervening after the first seizure, accompanied by fever, jaundice, hemoglobinuria, or a complete suppression of urine. They are rapidly fatal.

When the writer graduated in the late eighties, the treatment included both conservative and forcible measures. The former embraced sedatives, bleeding, veratrum viride, chloroform, and elimination by purgatives and sweating; while the latter consisted of forcible dilatation of the os, or, to speak more correctly, divulsion of the cervix and the termination of the delivery of the child with forceps or version. At this time aseptic surgery was developing; its increasing brilliant results, quite naturally, brought it into competition with the conservative treatment and accouchement forcé of eclampsia. In the late nineties we were performing immediate deliveries in eclampsia

by abdominal cesarean section, as recommended by Halbertsma, and later by vaginal cesarean section, as advocated by Dührssen. These operations are favored today by surgeons; but there is a growing reaction among obstetricians against such radical treatment, and obstetricians are now more in favor of medical and obstetric measures, except in cases complicated by rigid cervix, aged primiparae, contracted pelvis, or marked disproportion between the child and the mother's pelvis.

Formerly I was rightly classed as an "interventionist," being rather in favor of the cutting operations. Impressed, however, by the kindly and earnest criticism of your esteemed secretary, Dr. Zinke, who dissented from my advocacy of cesarean section in favor of the conservative treatment, I was prompted to review my surgical cases and became satisfied that some of them would have yielded favorably to more conservative measures. I have, therefore, for several years adopted a more conservative course by individualizing my cases and resorting to active, medical, or combined treatment as, in my judgment, the exigencies of the case may demand.

I wish now to invite your attention to a series of pre-eclamptic and eclamptic cases attended in consultation and in the hospital during the past four years.

The method followed is to give morphia hypodermically at reasonable intervals to reduce the respiratory movements to ten or twelve per minute; bleed, when the blood pressure is high, to reduce to 150, or thereabouts; wash out the stomach, leaving in two ounces of castor oil, irrigate the bowels and follow this with five per cent glucose and soda solution by the drip method. We feel that this method is very helpful even if, for any reason, we find it necessary to intervene surgically. In the latter emergency we would be guided by the condition of the cervix and menacing conditions as to which operation we would elect.

PRE-ECLAMPTIC TOXEMIA

CASE 1.—Mrs. S., multipara, white, aged thirty-eight. Admitted to Georgetown University Hospital. At term, headache, amaurosis, ptosis of right eyelid, blood pressure 210-132. Bag introduced. Living baby, weight, 11 pounds. Mother and child discharged in good condition.

CASE 2.—Mrs. K., white, multipara, eight months' gestation; marked toxic symptoms persisted in spite of rest, diet, etc. Blood pressure, 195. Two examinations by ophthalmologist at interval of a week; first examination negative; second, positive for retinitis. Sent to Georgetown University Hospital. Labor induced with bag. Puerperium normal. Mother and child all right.

CASE 3.—Mrs. L., white, aged thirty-seven, 4-para, seven months' gestation. Seen in consultation at Georgetown University Hospital, October 9, 1920. Patient blind and in coma. Vomiting. Treatment: Venesection, 500 c.c., replacement, glucose and soda solution. Bag inserted, but it was ineffectual. Meanwhile coma lifted and patient became rational. Labor spontaneous, complicated by prolapsed cord and

transverse presentation. Version. The child succumbed prior to delivery. Mother developed pleurisy on right side. She was aspirated and made a good recovery.

CASE 4.—Mrs. H., white, aged twenty-nine, 2-para, eight months' gestation, seen in consultation, headache, insomnia, general edema, blood pressure 165-128. Removed to hospital and labor induced. Result satisfactory. Mother and child living.

ECLAMPSIA

CASE 1.—Mrs. M., white, aged nineteen, primipara, at term. Seen in consultation at Providence Hospital, June 20, 1917. In labor 24 hours. Five convulsions, morphinized, mid-forceps delivery. Mother and child living. Two births since, both normal.

CASE 2.—Mrs. K., white, primipara, at term. Seen in consultation; pre-eclamptic; had convulsion during second stage of labor; mid-forceps delivery. Mother and child living.

CASE 3.—Mrs. B., white, aged forty, primipara, at term. Seen in consultation January 26, 1917. Patient very toxic, cannot see and is markedly edematous. Advised removal to hospital at once. While being prepared for operation she had a convulsion. Cesarean section was performed shortly after admission to Columbia Hospital. Four convulsions during the following thirty-six hours, after which she regained consciousness. Mother and child living.

CASE 4.—Mrs. G., white, aged thirty-three, primipara. Seen in consultation. Admitted to Georgetown University Hospital after having had several convulsions. Coma profound, cervix intact. She was bled and morphinized; but, as the convulsions recurred together with almost complete suppression of urine, cesarean section was performed. Child weighed 6.5 pounds; lived several hours. Patient had six convulsions in the hospital; three after the operation. Recovery uneventful. She was delivered of a second child March 11, 1919. Natural labor.

CASE 5.—B. C., colored, aged twenty-five, primipara. Ward patient. Admitted to Columbia Hospital in labor with history of two convulsions, and that she had been blind a week. Marked edema. Blood pressure 180-118. Treatment: Morphinized, and labor induced with bag. Patient regained consciousness before delivery. Child stillborn, due to tetanic contraction of the uterus. Mother made uneventful recovery.

CASE 6.—Mrs. L., white, aged eighteen, secundipara. Admitted to Georgetown University Hospital, July 7, 1918, having had six convulsions before admission. Marked edema, cervix intact, not in labor. Blood pressure, 210-132. Venesection, 20 ounces. Morphinized. Convulsions recurring and coma deepening, cesarean section was performed by associate, Dr. Lowe. Living child, at term, delivered. Five convulsions after operation. Patient rational on second day after labor. Mother and child discharged in good condition.

CASE 7.—Mrs. M., white, aged twenty, primipara. Private patient. Sent to Georgetown University Hospital in labor. Protracted first stage due to premature rupture of waters. When head was on perineum patient had a convulsion. Delivered with forceps. Mother and child living. Second birth, January, 1920. Pregnancy and labor normal.

CASE 8.—Mrs. S., white, aged twenty-three, primipara, postpartum eclampsia. Admitted to Georgetown University Hospital, in labor, May 20, 1918. First convulsion fourteen hours after delivery; three seizures in all. Bled 18 ounces, and morphia was given. Mother and child living.

CASE 9.—Mrs. T., colored, aged forty-three, multipara. Admitted to Georgetown University Hospital, June 4, 1918, with history of convulsions and in profound coma.

Marked edema. Blood pressure, 248-150. Bag introduced and venesection done. Owing to deep coma no sedative was given. Stillbirth. Patient left hospital in very good condition.

CASE 10.—Mrs. K., white, aged twenty-three, secundipara. Admitted to Georgetown University Hospital, March 15, 1918. Seven convulsions, edema and impaired vision. Blood pressure, 144-84. Morphine. Venesection; 1000 c.c. removed. Labor induced with bag. Child premature, lived 7 hours. Mother's recovery uneventful.

CASE 11.—Mrs. B., white, aged twenty-three, primipara. Admitted to Columbia Hospital, August 4, 1919, in coma having had three convulsions. Blood pressure, 145. Venesection, 500 c.c. Morphinized. Bougie inserted. Delivery following day. Premature child, seven months; lived seven hours. Mother living. Again pregnant. Eyes, kidneys, and blood pressure normal.

CASE 12.—Mrs. N., white, secundipara. Admitted to Columbia Hospital, August 8, 1919. Urine contains albumin and casts. Blood pressure, 198-104. Had convulsion at beginning of labor. Morphinized. Venesection, 22 ounces. Natural delivery. Stillbirth. Patient developed aspiration pneumonia, but recovered and left hospital, still anemic, but improving.

CASE 13.—Mrs. W., white, aged thirty, primipara. Seen in consultation at Georgetown University Hospital, July 31, 1918. Not in labor. Blood pressure, 142-92. Four convulsions. Morphinized. Venesection, 500 c.c. Following day, rational. Labor did not supervene for six days. Delivery natural. Mother and child living.

CASE 14.—Cr., colored, multipara. Admitted to Columbia Hospital. History of convulsions before admission; marked edema of body and vulva. Bled and morphinized. Regained consciousness and did not go into labor until three days later. Meanwhile the vulva was scarified and edema rapidly subsided. Labor and puerperium uneventful. Mother and child living.

CASE 15.—C., colored, multipara. Admitted to Georgetown University Hospital, December 9, 1919. Four convulsions. Blood pressure, 180-110. Venesection and morphine. Labor natural. Mother and child living.

CASE 16.—Mrs. C., white, aged twenty-three, primipara. Seen in consultation at Providence Hospital. Had been treated for toxemia. Flat pelvis. Seized with convulsion during trial labor. Head not fixed in pelvis. Cesarean section performed. Mother and child living.

CASE 17.—Mrs. S., white, aged thirty, primipara. Seen in consultation at Georgetown University Hospital, June 26, 1920. During tedious labor complained of diplopia and had two convulsions. Blood pressure, 198-120. Morphine given. Venesection, 600 c.c. Mid-forceps. Mother and child living.

CASE 18.—Mrs. J., white, aged nineteen, primipara. Admitted to Georgetown University Hospital, April, 1919. Blood pressure, 200-120. Two convulsions before admission to, and four while in, the hospital. Urine shows albumin and casts. Morphinized. Venesection, 500 c.c. Delivery spontaneous. Mother and child living.

CASE 19.—H., colored, aged thirty-two, primipara. Weight, 200 pounds. Admitted to Georgetown University Hospital, May 4, 1920, in labor. Blood pressure, 194-130. Urine contains albumin and casts. Had convulsion. Bled 500 c.c. Morphinized. Chill after venesection. Mid-forceps delivery. Stillbirth. Manual removal of placenta. Puerperium: Fever, maximum 101° F. Recovered. Second birth, May, 1921. Pregnancy and labor normal.

CASE 20.—Mrs. G., white, aged twenty-eight, primipara. Admitted to Georgetown University Hospital, May 24, 1920. In labor. Blood pressure, 180-130. Hot pack.

Membranes punctured at 2:30 P.M. the following day. Convulsion at 3:15 P.M. Morphinized. Venesection, 500 c.c. Low forceps. Mother and child living.

CASE 21.—Mrs. S., white, aged twenty-four, secundipara. Admitted to Georgetown University Hospital, June 4, 1920. Pre-eclamptic toxemia. Blood pressure, 168-110. Urine contains albumin and casts. Left occipitoposterior position of vertex presenting. Twenty-four hours after admission she had the first convulsion. Second convulsion, 4:15 A.M., of the sixth. Bled 500 c.c. Third seizure at 6:00 A.M. Fourth and last convulsion at 3:00 P.M. In labor 62 hours. Treatment: Morphine, venesection, mid-forceps. Mother and child living.

CASE 22.—Mrs. B., white, aged twenty-six, primipara, at term. Seen in consultation. Admitted to Columbia Hospital, September 14, 1920, 4:00 P.M. In labor. Pre-eclamptic history: Headache, edema, general dimness of vision, etc.; urine contains albumin and casts. Membranes ruptured at 8:45 P.M. Pains regular. Thirteen hours after admission she had a convulsion followed by two more attacks at fifteen-minute intervals. At this time I saw the case in consultation. Examination revealed the cervix effaced and the os dilated about the size of a silver dollar. Head well engaged in left occipitoposterior position. As patient reacted well after convulsions, and labor progressed satisfactorily, conservative treatment was elected. As blood pressure had risen to 170-125, five hundred c.c. of blood was removed. Morphia was given at intervals; but the terrified nurse failed to carry out instructions to keep respirations down; so convulsions recurred, fifteen attacks in all. At 4:15 P.M., the cervix was fully dilated; forceps were applied (Scanzoni) and delivery effected. Puerperium normal. Mother and child living.

CASE 23.—Mrs. Z., white, primipara. Seen in consultation at Georgetown University Hospital. Postpartal eclampsia. Labor reported normal. Six hours after delivery she had three convulsions in 45 minutes. Blood pressure, 190. Treatment: Morphine and venesection, 1000 c.c. Mother and child excellent. Second labor, in 1920, normal.

CASE 24.—Mrs. M., white, 3-para; seen in consultation. Postpartal eclampsia. Treated for toxemia from seventh month, evidently without much relief as cardinal signs, such as headache, dimness of vision, edema, and positive urinary findings, persisted. Blood pressure varied from 140-165. On admission to hospital blood pressure was 188-110. Labor normal and four hours in duration. Six hours postpartum (3:00 A.M.) she had a convulsion, and four more before 7:20 A.M. Morphine given. Sixteen ounces of blood removed. Despite vigorous elimination and heart stimulation coma gradually deepened; she had four more convulsions on the third day, and died in coma on the fifth day. Temperature had risen to 109° F.

CASE 25.—Mrs. V., white, aged twenty-eight, secundipara. Seen in consultation at Sibley Hospital, March 26, 1921, at 10:00 A.M. Had severe hemorrhage from marginal placenta previa. Unassisted delivery at 7:20 P.M. The following morning, after a restless night, patient had several convulsions in quick succession. Blood pressure, 170. Morphine was given and venesection performed, twenty ounces of blood removed. Patient in semicomatose state until third day; then gradually lessened and was rational on fourth day. Made splendid recovery. Child living.

CASE 26.—Mrs. W., white, aged twenty-six, primipara. Seen in consultation. Admitted to Georgetown University Hospital, May 19, 1921, at 7:15 P.M. History of persistent pre-eclamptic toxemia despite treatment. In labor. At 8:25 P.M. had a convulsion, and at 10:00 P. M., a second seizure followed. Gradually deepening coma uninfluenced by removal of eighteen ounces of blood and other measures. Labor was terminated with low forceps. Stillbirth, due to toxemia. Coma never lessened and temperature rose to 109° before death took place on the third day.

CASE 27.—Mrs. R., white, aged twenty-seven, primipara; seventh month of gestation; seen in consultation. Admitted to Georgetown University Hospital, March 5, 1920, with history of vomiting extending over two weeks. Blood pressure, 130-104. Urine shows albumin and casts. The toxemia yielded to diet and elimination. Left hospital at the end of two weeks, much improved. Readmitted April 27, in labor. Had convulsion during second stage. Delivered with low forceps by attending physician. Mother and child living.

CASE 28.—Mrs. H., white, aged thirty-three, 4-para, eight months' gestation. Seen in consultation, May 11, 1921. History of several convulsions. Patient removed to Columbia Hospital for observation. Previous pregnancies and labors reported normal. Blood pressure, 128-88. Urine reveals albumin and granular casts. Treatment: Bromides and eliminants gave relief and patient was sent home on fourth day. Normal labor one month later. Mother and child living. There is, likely, a hysterical factor in this case. The physician reports that, beginning three weeks after confinement, patient had a convulsion, and that they recurred from time to time since.

CASE 29.—Mrs. Y., primipara, seventh month of gestation. Seen in consultation at Georgetown Hospital, September 12, 1921, at 10:30 P.M. Marked toxic condition extending over several weeks, which had not yielded to treatment. Labor pains began about 7:00 P. M. At 9:30 P. M. she had a convulsion and another, one hour later. Blood pressure, 170. Morphinized, and sixteen ounces of blood removed. Membranes ruptured spontaneously at 5:00 A. M. Spontaneous delivery occurred at 8:00 A. M. Child living. Mother rational and doing well.

SUMMARY

It will be noted that nearly all of the cases had suffered from preeclamptic toxemia. Several had been treated, but the toxemia persisted; some had been treated indifferently, and most of them not at all.

We find that morphia, if given properly, will control the convulsions. Its ease of administration and certainty of action, make it preferable to other sedatives.

Venesection we believe to be a most valuable measure. Where the blood pressure is high, with cyanosis, recurring convulsions, deepening coma and threatened edema of the lungs, it is particularly serviceable. Its beneficent effect was strikingly shown in a postpartum case, seen in consultation recently, and the writer is convinced that the bloodletting was the principal means of saving the patient.

Cesarean section was performed by election in a primipara over forty years of age; another was performed on a primipara with flat pelvis, who had a convulsion during a test of labor. The head was not engaged in the brim. In the third and fourth cases, morphinization and bleeding had been done before the cesarean section was undertaken. We believe these patients were benefited by the tranquilizing effect of the sedative and elimination obtained before operation.

All of the forceps cases were done after complete dilatation of the os in order to expedite the delivery.

Labor was induced with the bag in all of the threatened eclampsias, and in three of the actual eclampsias; the bougie was used in one case.

We do not forcibly dilate an intact or rigid cervix. It is irrational and unjustifiable. The physiologic and anatomic changes necessary to soften and unfold the cervix and dilate the os, must be borne in mind. To divulse the intact cervix in a few minutes by instrumental or manual methods, is unscientific, dangerous, and brutal. It violates Nature's law, which, under normal conditions, requires hours, thus preserving the integrity of the soft parts.

We do not give chloroform or nitrous oxide, because both induce acidosis. Ether, while not free from objection, is the least harmful anesthetic, but its administration should be restricted to the time of operative intervention.

The salutary influence of sedation and elimination was demonstrated in two of the antepartum cases; the convulsions ceased, the patients became rational, and spontaneous labor occurred several days later. Several of the intrapartum cases also regained consciousness before birth.

Of the two deaths, one at term had the first convulsion six hours after a normal delivery; the other, an antepartum case of seven months' gestation, had two convulsions and lapsed into gradually deepening coma, which continued until death took place on the third day. Both of these cases had been carefully supervised for weeks before the eclamptic seizures and the persistence of the toxemia, despite treatment, indicated that they might have been saved by induced labor.

From the foregoing data we offer the following deductions: 1. The importance of prenatal care. 2. Intermediate and conservative treatment yield lower mortality and morbidity than is obtained by surgical and forcible intervention. 3. Immediate delivery by cesarean section is rarely necessary, unless there are present indications of disproportion, rigid cervix, etc. 4. Radicalism is prompted largely by fear and expediency.

Prenatal care means careful supervision of the pregnancy, interrogating the various organs and functions from time to time. Persistent high blood pressure, resisting treatment, points to kidney insufficiency. It is here that the ophthalmoscope may reveal a developing retinitis long before the patient complains of impaired vision or the urine shows albumin and casts. The ophthalmoscope is the only means by which the earlier and relatively much less serious stages of toxemic retinal involvement can be detected. A progressive retinitis is a valuable prognostic sign for induction of labor, safeguarding vision and averting the outbreak of eclampsia. By this valuable procedure we were able to check up a developing retinitis in one of the pre-eclamp-

tic cases, and labor was induced with gratifying results, saving both mother and child.

The blood and urinary findings, showing an increase in retention of nitrogenous products, particularly uric acid and creatinin, with changes in the ratio of urea nitrogen and nonprotein nitrogen are indicative of kidney insufficiency and give unfavorable prognosis, if the toxemia is not controlled.

The frequency of eclampsia could be greatly diminished if more careful supervision of the pregnant woman was exercised. The perfunctory examination of the urine for albumin, during the latter weeks of pregnancy, is not sufficient. The constitutional signs and symptoms should be closely scrutinized and if these persist following the use of vigorous and active measures, the safety of the mother and infant lies in the induction of labor.

The psychology in the treatment of eclampsia from the standpoint of the physician and surgeon is interesting. Analyzing my own state of mind I was dominated by subconscious fear, due primarily to want of familiarity with the disease and some unfortunate experience with accouchement forcé. Naturally the application of the cesarean section appealed to me as a saner and safer method. I therefore advocated and followed it. Upon review of my surgical work, however, I became convinced that some of the cases I had subjected to section, could have been delivered by more conservative measures, thereby preserving the integrity of the uterus. This proved to be the turning point in my attitude towards eclampsia. From then on I found myself studying each case with equanimity and deliberation and balancing action on judgment.

Fear and expediency are, I am satisfied, from experience as a consultant and from observation, potent factors in the radical treatment of eclampsia. The attending physician, unaccustomed to treating such cases, is very apt to become panicky and urge immediate delivery. The consulting surgeon, who thinks largely in surgical terms, not infrequently acquiesces and performs cesarean section.

It is easy to yield to such importunity and even a fatal result is likely to be accepted without question. It is not easy, however, for the obstetrician who elects to conduct the case along conservative lines extending over some hours. This postulates obstetric judgment and courage.

The keynote in the treatment of eclampsia is prevention. Yet either in the prevention or the treatment of actual eclampsia an even mind is essential. "*Aequam memento rebus in arduis servare mentem,*" as the old Latin bard has sung.

It was the clinical observation of Semmelweiss which led to the recognition that puerperal fever and wound infection are identical

and preventable; Pasteur lifted the veil which for centuries hid the cause of disease, by exposing their microbian origin, while Lister laid the foundation of aseptic surgery with its manifold possibilities in the cure and alleviation of maladies; so may it be the good fortune of another genius to find the key that will unlock the mystery of the toxemias of pregnancy that motherhood may be immunized against this frightful scourge. May this Association be the parent of this genius.

DISCUSSION

DR. E. GUSTAV ZINKE, CINCINNATI, OHIO.—I congratulate Dr. Moran not only on the splendid manner in which he presented the subject, but also upon the change which has come over him in his method of practice. I have for years held that surgery has contributed absolutely nothing to the reduction of maternal or fetal mortality in puerperal eclampsia. The old saying of obstetricians of fifty and seventy-five years ago—"treat the convulsions and let the pregnancy alone" —is a good one; but, of course, there are exceptions. I regret very much that the treatment of puerperal eclampsia by veratrum viride has received so little attention, not only by the obstetricians of this country, but by those abroad. An eclamptic woman in labor, especially if the first stage has been completed, should be delivered as soon as possible; but an eclamptic not in labor, one in whom the seizures begin perhaps during the fifth, sixth or seventh month, is an entirely different matter. I have had cases and have seen cases in the hands of other men, which were seized with puerperal eclampsia during the sixth and seventh month, have three, four or five seizures, and then the attacks would cease and the patients go to the end of term and deliver themselves without difficulty.

Veratrum viride is the remedy par excellence in the treatment of eclampsia. If it is administered properly, in antiseptic preparation, it arrests the convulsions, the woman goes on to the end of term and in nearly all instances delivers herself. Eclampsia is, in my opinion, a strictly medical disease. Cesarean section and accouchement forcé are absolutely unjustifiable in the treatment of puerperal eclampsia in the absence of other indications. This has been the position I have taken for the last fifteen years and I have seen all the varieties of puerperal eclampsia. One fact should not be forgotten: Puerperal eclampsia may be produced by three causes, the most frequent is kidney insufficiency; the second, acute yellow atrophy of the liver; the third, which is the rarest, an apoplectic seizure which cannot be cured by any means. In other words, some cases are fatal from the start; no matter what you may do, they will die.

DR. JOHN O. POLAK, BROOKLYN, NEW YORK.—In the first place it seems to me that the proper treatment of eclampsia should be the preventive treatment. No matter whether we have adopted the surgical method of delivery or the expectant plan of treatment, which we have been using for the past four or five years, we have found that there is very little difference in the actual mortality. The eclamptic patient is an exceedingly bad surgical risk. Those of you who have seen these cases and have followed them through their convulsions have noticed that at first there is an increased leucocytosis and as the convulsions increase the leucocytic count falls. Those who are very toxic never have any increase in the leucocytes, which immediately condemns them from the surgical standpoint. The temperature increases with the convulsions and that, again, condemns them from the surgical standpoint.

I was "brought up" on veratrum viride and we used it with my former chief

for years, and we were losing 18 to 20 per cent, and with the morphine method about the same. We cut it down for about a year to about 15 per cent but now it is about 20 per cent again. With the surgical method we lost about 21 to 23 per cent as an average over a period of several years.

Two classes of cases come to us, one in which the toxic effect is primarily exerted on the liver and the oxidation is not complete, the toxic material enters the blood, acting as an irritant on the kidney. The other class presents a primarily sick kidney. I do not fear the latter as I do the fulminating type.

We have found that the blood pressure is the important thing in diagnosis. In making tests over many weeks we found that the hypopressure is characteristic of the normal pregnant woman. The moment there is a hypertension with relative increase, we are beginning to get into trouble, and a pressure of 130 is more dangerous and significant in the pregnant than in the normal woman. We find that the gradual increase of the blood pressure precedes by many days the toxic picture in either urine or blood. We are doing blood chemistry tests on every case, and nothing is so disappointing as this blood chemistry picture. There is nothing that gives us an early sign of what is happening in these women, so we have come to depend upon the clinical findings and the blood pressure rather than any other points.

DR. MAGNUS A TATE, CINCINNATI, OHIO.—So long as we do not know the cause, we are bound to have a variety of treatments for puerperal eclampsia. The essayist very forcibly spoke of prenatal care; and one of the most important things is blood pressure, as emphasized by the last speaker. Irving's statistics show very conclusively the value of the blood pressure, as a patient with a pressure of 180 is almost sure to have an eclamptic seizure. A valuable adjunct to the treatment of puerperal eclampsia is washing out the stomach and the flushing of the bowels, and, if necessary, repeated gavage.

I am sorry to disagree with Dr. Zinke about veratrum viride. I have tried it conscientiously for many years, but have given it up, because, I find it an extremely depressing drug, in some cases very dangerous, and the mortality from its use is very high.

I have never done an abdominal cesarean section for a case of eclampsia. I have never seen a case where I thought it was indicated. If the os is soft and dilatable, then I believe delivery should be forced. If the case be one in which the os is not dilatable but rigid, it seems to me, the expectant treatment is the best to follow.

Of drugs, morphia, in my experience, has given the best results, one-half grain to the dose, repeated as necessary.

DR. M. PIERCE RUCKER, RICHMOND, VIRGINIA.—I would like to ask Dr. Moran to tell us, in closing, if he has had any unfortunate experience with morphine. I will cite one case very briefly to illustrate what I mean.

Several months ago I had a patient who was taken with convulsions. We started morphine, stomach washing, irrigations, and so forth, and everything was going on nicely. The respirations were reduced to fourteen per minute and at 1:15 she got her last dose of ¼ grain of morphine. At 5 o'clock she suddenly stopped breathing and became livid. I pulled her over the edge of the bed and started artificial respiration and washed the stomach out again, thinking possibly some of the morphine was being reabsorbed. She became conscious and talked, but only three-quarters of an hour later had a similar attack. As soon as artificial respiration started her normal respiration I put her on the table and did a version. She woke up just as the head was being expressed and the case terminated very favorably for the mother and baby. The pulse went down to 88 or 90 although it had been around

150. The blood pressure was 130 fifteen minutes before she was taken with the attack.

Tweedy, I believe, emphasized the fact that a case of eclampsia should not be left in the charge of anyone but an obstetrician, and I think this case demonstrates that fact.

The patient received 1¼ grains in four hours. I have given as much as 5 grains in seven hours without bad effect, and would like to get Dr. Moran's idea of the cause of this reaction in this particular case.

DR. JAMES E. DAVIS, DETROIT, MICHIGAN.—I would like to ask Dr. Polak in regard to his experience with the blood chemistry findings, whether he has come to the conclusion from the negative or positive phase of the findings that blood chemistry is of no use.

He surely does not wish us to infer that when a patient in the latter months of her pregnancy changes from a normal non-protein nitrogen to 50 or 60 mgm. per 100 c.c. of blood and shows also a creatinine increase, that such a finding is not a reliable guide.

DR. POLAK (replying to Dr. Davis.)—What I meant to convey was that I expected to find a constant evidence of retention in these repeated blood chemistry examinations. Where we find an increase of creatinine or nitrogen that always indicates to us a bad prognosis. We never carry that case along, but I have been disappointed in the fact that we do not find the constant changes in the blood which correspond to the clinical picture and the blood pressure readings.

DR. MORAN (closing the discussion).—I much prefer to bleed outwardly than to bleed inwardly. Therefore, I do not use veratrum viride. I am in thorough accord with the gentleman who discussed the dangers of veratrum viride. It is a purely depressant drug and when it is once used it is hard to combat its effect. Of course, you can bleed to any point you wish and get the blood pressure down to any desired point. Our purpose in not carrying the pressure below 150 is this: If we wish to give an anesthetic or to operate we do not want it too low, so we bring the pressure to 150 or thereabouts.

As to Dr. Rucker's question about the morphine, I am rather inclined to think that the quick reaction was due to something other than the morphine. Otherwise, the patient would not have so quickly recovered. As to massive doses I am always careful in giving morphine to watch the patient and the effect. I have seen one fourth grain of morphine given without my order by an interne reduce the respirations to six, and the interne was very uncomfortable. In giving any drug we should carefully watch the effect to see just what that particular patient needs. One-fourth grain of morphine is all that is necessary for one patient, while two grains may be required for another. In cases of coma we do not need morphine at all. In conclusion, I want to emphasize again the importance of prenatal care.

As to the blood pressure, I mentioned that the eyegrounds were examined because of the increased blood pressure. I consider it the most valuable of all the signs we have. The urinary findings come late but the blood pressure is significant and on examination of the eyegrounds you will very often detect a retinitis, and that the patient is in the danger zone. In the two cases of fatality reported in the paper, I am sure if examination of the eyegrounds had been made weeks before and the blood pressure checked up it would have been of inestimable value and I believe those patients might have recovered.

A STUDY OF THE ORIGIN OF BLEEDING IN ECTOPIC PREGNANCY

By John O. Polak, M.D., F.A.C.S., and Thurston S. Welton, M.D., F.A.C.S., Brooklyn, N. Y.

THE bleeding in tubal pregnancy occurs as an early suggestive symptom in all tubal abortions, during the ovular unrest preceding tubal rupture, and, usually, at the time of the primary rupture.

To understand the mode of occurrence of this hemorrhage one must accept the analogy between uterine pregnancy and tubal gestation, with certain differences due to the morphology of the tubal mucosa. Furthermore, the mode of implantation of the ovum in the tube has a definite causative significance.

The ovum can develop only on a spot free from epithelium, sinking through the decidua to rest on the subepithelial layer of the muscularis, and producing by its presence such reaction as to provoke dilatation of the lymph spaces and edema of the myometrium and endometrium immediately surrounding the ovum.

As the ovum sinks in, the side walls of the cavity become united over the ovum by organized blood clot and fibrin and form a false reflexa. The decidual reaction in the tube is imperfect and scattered. There are cases in which no true decidua has been found (Aschoff), but where there is decidual reaction it is the same as found in the uterus; it is also noted at points in the tube, remote from the seat of the ovum implantation.

Fecundation is definitely known to take place in the tube during the passage of the ovum through the tube to the uterus. It has been shown that "in a tube, partially recovered from an inflammatory process, there may be found pockets, diverticula, and constrictions which cause the arrest of the majority of ova, and that implantation takes place at any point at which this arrest occurs." (Mall.)

This implantation may be columnar, intercolumnar or centrifugal. Columnar embedding is rare and occurs when the ovum attaches itself to one of the tree-like folds of the tubal mucosa, later it becomes attached to other folds; but at no point is it in contact with the tube wall itself. In such an implantation the ovum derives its nourishment from the blood vessels of the mucosa until the mucosa becomes eroded by the action of the syncytial cells, and then the ovum comes to lie in the tube wall when the villi penetrate the muscularis.

In the intercolumnar form of implantation the ovum embeds itself

in the cleft between the folds of the tubal mucosa and thus rests upon the surface of the tube wall, at once eroding itself into the muscular coat. In this case the mucosal folds unite over the embedded ovum and form a false reflexa.

In the centrifugal implantation, the ovum sinks into the wall of the tube and the villi invade the muscular wall and vessels, including all structures, even the serosa. The pseudoreflexa is formed by the side walls made up of the muscularis and the mucosa, into which the ovum has sunk.

The invasion of the blood vessels by the villi causes hemorrhage into the intervillous spaces. The villi may extend up to and through the

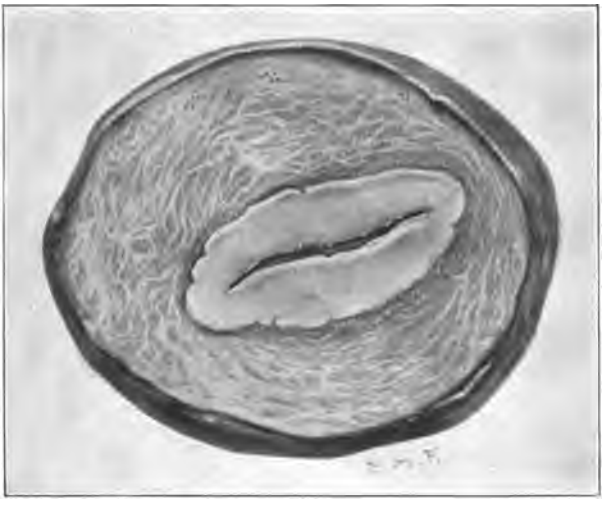

Fig. 1.—Cross section of uterus showing decidual development in a case of three months' ectopic gestation.

serosa; rupture usually takes place through penetration of the tube wall at the placental site, as a result of this erosion by the villi.

One observation has been constant, no matter what form of implantation has taken place, i.e., there is always an excessive amount of hemorrhage about the ovum, owing to the fact that there is no true decidua to protect the tubal vessels from erosion. The constant erosive action of the trophoblast causes considerable hemorrhage. Mall states that the blood in immediate apposition to the trophoblast does not clot, and thus continues to contribute towards the sustenance of the ovum.

Our observations are in accord with Mall's and Litzenberg's that, whenever we have found an early unruptured pregnancy, the ovum was very small and separated from the tubal wall by a definite layer of blood.

The tubal and uterine placenta are identical in formation. The pathologic changes which take place in tubal pregnancy are due to the thin tube walls and the absence of a true decidua serotina, which allows easy invasion by the trophoblast and syncytial cells; consequently there is no active connective tissue reaction set up by the presence of the fetal cells.

The villi rapidly penetrate the tube walls and then perforate the serosa, producing a porosity which allows blood to escape through the tube wall into the peritoneum, even before the tube wall is so weakened as to produce rupture.

Owing to these changes the tubal placenta suffers from lack of nutrition, which explains the number of pathologic embryos found in tubal pregnancies. Syncytial cells and bits of villi are often found in the tubal veins remote from the site of the pregnancy.

Fig. 2.—Author's specimen, showing complete decidual development in the uterus and incomplete reaction in the tube in a nine weeks' pregnancy. The imperfect reaction in the tube is the basic cause of the symptoms of tubal abortion or rupture.

Whenever an ovum implants itself in the tube wall, the gestation sac is bounded on all sides by a layer of trophoblastic cells and masses of fibrin, and a pseudodecidua reflexa is formed by trophoblastic elements and the overlying mucosa. Frequently the trophoblastic cells, owing to their erosive quality, lie between the muscle bundles; the decidual reaction is imperfect and irregular, found in remote portions of the tube, while the syncytial cells invade the blood vessels in the tube wall. The absence of a developed decidua allows excessive erosive action in the tube wall, and favors early rupture of the gestation sac.

Owing to the effusion of blood into the imperfectly formed decidua, and between the underlying tube wall and ovum and the separation of

the nutritive villi from the tubal vessels, the blood accumulated about the ovum, increases the separation, stimulates peristaltic tubal contraction, and favors tubal abortion.

Whenever pregnancy occurs, no matter what its location, a decidua vera develops within the uterus. The uterus is enlarged because of the hyperemia and thickened endometrium. These changes in the endometrium are quite similar to those found in the decidua vera in early intrauterine pregnancy.

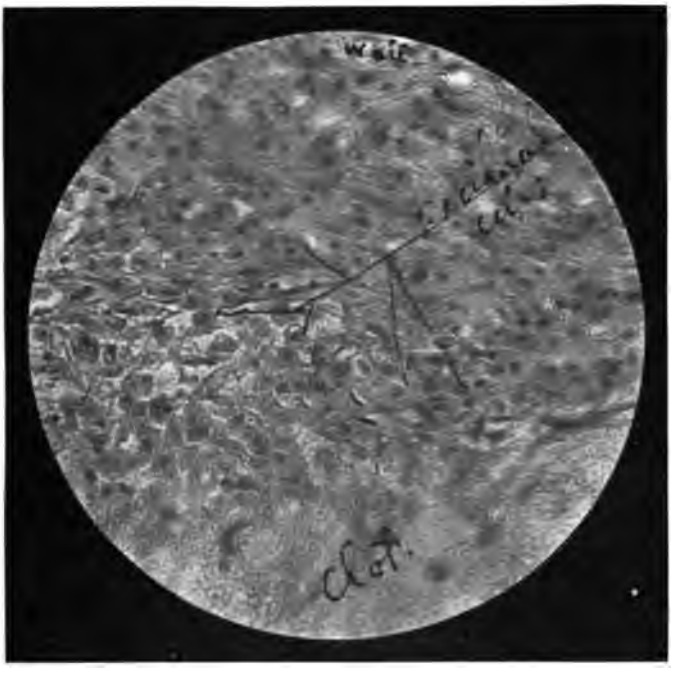

Fig. 3.—Section of tubal wall from an ectopic gestation, showing hemorrhage into the decidua at a point remote from the site of implantation of the ovum.

While tubal pregnancy is being terminated, the tube undergoes a measure of intermittent contraction, endeavoring by its peristaltic action to expel the contents; these contractions are transmitted to the uterus, which in turn contracts as in abortion, giving rise to uterine pain. The clinical expression of these uterine contractions is bleeding from the endometrium with extrusion of portions of the decidua.

Uterine bleeding indicates ovular unrest in the tube, due to hemorrhage about the aberrant ovum, and the threatened termination of the ectopic pregnancy. So long as the embryo is living and development is in progress, there is no uterine bleeding.

The uterine bleeding, which is usually small in amount, may continue for a considerable time after the attack of pelvic pain which, apparently, marks the destruction of the embryo. This is due to the

fact that the termination of the tubal pregnancy is not necessarily at once complete, chorionic villi remaining alive, exerting their stimulus upon the uterus.

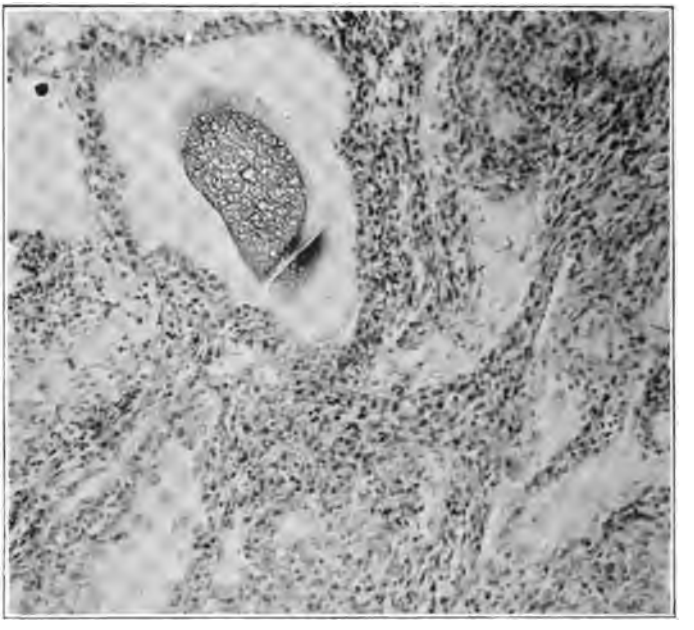

Fig. 4.—Photomicrograph of a section of uterine decidua from a case of ruptured extrauterine pregnancy at the third month, showing absence of blood in the decidual layer.

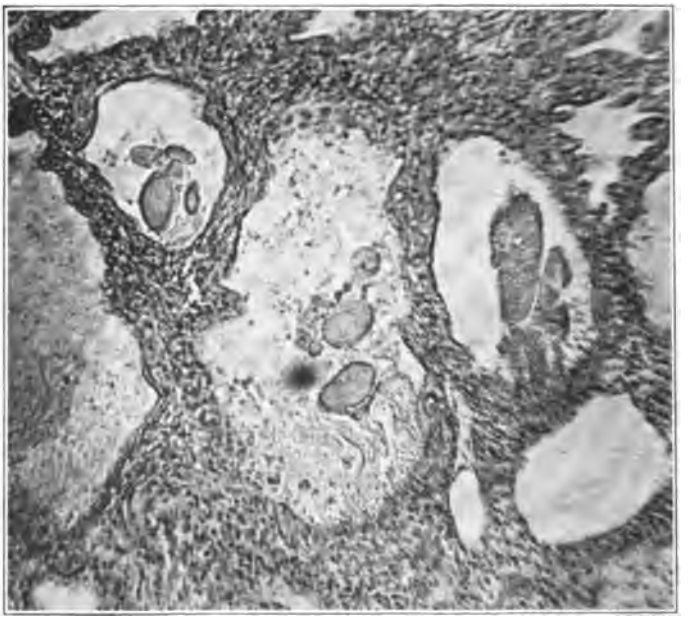

Fig. 5.—Same as Fig. 4, showing glandular structure.

Sampson found that the uterine bleeding, in all cases, was of venous origin and arose from the endometrium, and that blood did not escape from the tube into the uterine cavity. On the other hand, we have demonstrated that when the pregnancy is close to the uterus, some blood does escape through the uterine end of the tube, that the metrorrhagia has both a uterine and tubal origin, and that there is always hemorrhage into remote parts of the tube, just as there is decidual reaction at other than the seat of the ovum.

The uterine involution which takes place following the complete termination of tubal pregnancy is analogous to that following labor or abortion. When involution is delayed there is an incomplete termination of the tubal pregnancy, just as there is delayed involution when there is retained material in a uterine abortion.

The decidual cast of the uterus is passed, either *en masse,* or piecemeal, in fully 50 per cent of the recorded cases of tubal pregnancy. The pain accompanying this expulsion is nothing more than a sympathetic labor on the part of the uterus. All authorities are agreed that, in every instance where a fecundated ovum has embedded itself and developed, a uterine decidua is formed.

The ectopic cast has definite microscopic characteristics. It may be divided into a distinct compact and spongioid layer and fails to exhibit any evidences of chorionic villi. The large decidua cells with well defined nuclei, packed closely together, which make up the decidua compacta, are always characteristic proof of pregnancy.

CONCLUSIONS

(1) Our studies have shown that a decidual reaction may be found at several points in the tube in ectopic points often far remote from the seat of implantation.

(2) That coincident with the separation or death of the ovum by hemorrhage into the decidua, there is bleeding from the uterus and also bleeding from the several points of decidual reaction in the tube.

(3) That tubal peristalsis and the *vis a tergo* of the clot in the tube, expels blood from the abdominal ostium into the peritoneum, which gravitates into the culdesac.

(4) That the same factors contribute a portion of the blood, making up the bloody discharge from the uterus, which signifies the separation or death of the embryo.

DISCUSSION

DR. HERMAN E. HAYD, BUFFALO, NEW YORK.—Dr. Polak has emphasized the importance of the corpus luteum in connection with this problem. Anything that explains to us the complex and complicated methods of creation is, of course, especially interesting. The essayist has shown us how a tubal pregnancy is practically the same as a corporeal, except that in the one a better decidua is formed and better implantation; while in the tube it is distributed more irregularly. I think he is justi-

fied in the conclusions he has drawn, that the hemorrhage is consequent not only upon the peristaltic action of the tube, but also upon some endocrine influence.

Perhaps some of you have seen the reports of the work of a veterinary in Danbury, Connecticut, where there was a splendid herd of cattle on a stock farm, but only thirteen viable calves were born in a year. He found upon investigation that these cattle were infected with a virulent coccus similar to the gonococcus, and as a result there was a peritonitis and a subacute salpingitis and oöphoritis with thickened covering and as a result, the corpus luteum could not rupture. These animals did not therefore "come into heat" and no young were born. By injections into the vagina, massage and friction, he succeeded in breaking these graafian follicles, and they let loose their unabsorbed corpora lutea, and every one of these animals within eighteen to thirty hours came in heat and became impregnated. Now, when this man made a mistake and found that some of these animals he was massaging were already impregnated, he produced a terrific intraperitoneal hemorrhage or an abortion within twenty-four hours, showing that the corpus luteum had much to do in these hemorrhages.

Dr. Polak has brought out the fact that these uterine hemorrhages are a symptom, and they will continue no matter what kind of conditions are opposed to them in the way of treatment, so long as that corpus luteum exists in that ovary.

CARCINOMA UTERI

By Charles L. Bonifield, M.D., Cincinnati, Ohio

CANCER is still the most dreaded of all diseases. Cancer of the uterus is one of the most frequent and at the same time one of the most fatal and most disagreeable manifestations of this disease. Its treatment still leaves much to be desired. We have two other papers on the program on this subject, one dealing with its treatment by radium, and the other with the extending of the radical operation for its surgical removal. I will simply speak of a few points, with which I have been impressed as a result of my own medical experience, and the observation of the work of others.

The cause of cancer has not yet been determined, but there are two factors in its etiology that have impressed every observing clinician, as being very important. The first is the age of the patient at the time cancer occurs, and the second is chronic irritation. The period at which cancer of the uterus is most prone to occur begins about forty, and ends about fifty-five. Many cases are seen in earlier life, many later, but this is the real cancer age. It cannot be emphasized too strongly or too frequently that the patient should be brought to that period of her life in the best possible condition, physically, particularly as regards her uterus. Therefore, all lacerations of the cervix that produce any irritation at all should be repaired, and if a chronic endometritis exists, it should be cured before this period arrives.

The next point I wish to emphasize is that for a number of years we have been trying to preach to the laity the danger of cancer, and in this way to get to operate and treat cancer in its earliest stages, but that our efforts have not produced the results which we hoped. To my mind there is some objection to carrying on the propaganda as it has been carried on in the past. Something like a year ago, we had "Cancer Day," in Ohio, and a number of Protestant pulpits in Cincinnati were filled with speakers on cancer. I know of at least one instance where a woman fainted, and had to be carried out after hearing a discussion on this subject by one of the speakers, and many more were so frightened that the talks did them no good. I maintain that to arouse hysteria in regard to these things is folly, and does not bring results.

The thing I wish to suggest instead of this, is that every woman who has borne children, and therefore has the strongest predisposition or the strongest predisposing cause that we know of, when she reaches the age of thirty-five or forty should go to her family physician and be

examined to see if any symptoms of cancer are manifesting themselves. It is necessary for us to go to our dentists every six months in order to save our teeth, and so it certainly seems worth while for the woman to subject herself to this little inconvenience and expense for the purpose of saving her life.

It has been my experience, and I believe that of most of us, that 75 per cent of the cases of cancer that come into the office are already so far advanced that the hope of permanent and complete cure has already gone by.

The next point I wish to speak of is the treatment. I think this might be divided into four methods; cautery, x-ray, radium and surgery. The cautery is one of the oldest treatments and has given good results, but it is not applicable to all the cases and has not become very popular. The same may be said of the Percy treatment by heat. The x-ray I believe is capable of further development, and I have great hopes that some time it will be a more powerful remedial agent than any we have at present. I understand that in Germany they are making tubes that will make it more potent, but at present it does not, in my opinion, answer the purpose as well as other methods.

In some places, the most popular and to some people the most attractive treatment is radium, but the very expense of this treatment will for many years to come, prevent its applicability to the vast majority of cases of cancer of the uterus, but this to me is not a very depressing fact because I still believe that the thorough removal of cancer by the surgeon is the best treatment that has yet been devised. Just what the procedure shall be must depend upon the judgment of the surgeon into whose hands a given patient falls. When we first operated for cancer, the vaginal hysterectomy was done, and by and by the operation was extended and extended as we became more radical, and of late years, we have been preaching and practicing that the radical operation should be limited to those cases in which we feel very sure that we are able to remove the disease in its entirety. I concurred in that belief for many years, but my observations in recent years have convinced me that I was mistaken. Up to that time when a case came to me, that I regarded as inoperable for thorough cure, I was satisfied to curette away the tissue as far as possible and then cauterize with the actual cautery, following that with applications of formaldehyde. I relieved these patients somewhat and prolonged their life, but all the time these patients knew that the disease was still there. The psychologic effect was bad and death followed, preceded by those dreadful complications such as vesicovaginal and rectovaginal fistula. In operating I occasionally made mistakes. I thought when I examined a patient, I would be able to do a complete hysterectomy,

but when I opened the abdomen, I found I could not get quite all the disease. Observation has convinced me that my mistake was a fortunate one for the patient, for she lived longer than the others, and when she died, she passed away with less discomfort.

Such cases have now become sufficiently numerous to convince me that my former teaching and practice was a mistake, that wherever it is at all practical to do a hysterectomy, it should be done. These are the points that I particularly wish to emphasize, but I also wish to say: The advocates of radium claim that if they do not cure the patients, they relieve the pain, and they die happily. It has been my fortune or misfortune, to see a number of cases dying after treatment by radium, and one of them, I think, died the most miserable death of any patient with cancer of the uterus that has been under my care.

SOME PHASES IN THE EVOLUTION OF THE DIAGNOSIS AND TREATMENT OF CANCER OF THE CERVIX

By Roland E. Skeel, M.D., F.A.C.S., Los Angeles, Cal.

ONE who peruses the literature of the preceding century in a search for data on cancer of the cervix, is likely to be the victim of conflicting emotions when his labor is completed. He will be deeply impressed by the magnificent advance which the profession has made in its knowledge of pathology, the prevention of infection, and improvement in operative technic; and as profoundly depressed by the absence of corresponding improvement in the ultimate mortality rate of the disease.

It was my intention in planning this paper to consider the diagnosis and treatment of cancer of the cervix in four principal epochs of the last one hundred years; first, the preanesthetic; second, from the discovery of anesthesia until the time of general adoption of antiseptic methods; third, from the preceding until the publications of Wertheim's panhysterectomy; and fourth, from the latter to the present, a time when it is felt that a new era is dawning, one which is likely to persist until the discovery of the ultimate cause of cancer leads to the development of a positive cure.

Somewhat to my surprise there appeared to be no significant change either in methods of operation or the results obtained following the general introduction of anesthesia; and operations for cervical cancer were denounced, thereafter, in almost the identical language used before, excepting that the term painful occurred less frequently. So the plan of study was changed to make the first era extend to the time when aseptic and antiseptic principles were universally adopted, i.e., the 1880-1890 decade, the second from 1890 to 1907; the third from 1907 to 1921.

Diagnosis and treatment are considered together since, at least, some of the improved results of modern treatment can be conclusively traced to earlier and more accurate diagnosis as well as more effectual treatment. It also seems logical to begin our study with the opening of the last century; for while there had been casual mention of operative procedures for the relief of cancer of the cervix for many years, the first systematic attempt at amputation of the cervix seems to have been made by Osiander in 1802, at vaginal hysterectomy by Sauter in 1822, and Langenbeck's first abdominal hysterectomy was performed in 1825.

At this time the diagnosis of cancer was accomplished by clinical

methods only; and while the microscope was occasionally employed for the study of pathology, there was no definite demonstration of the difference between the minute anatomy of cancer and other new growths. The microscopic differential diagnosis of early cancer was unknown.

As late as 1857 Churchill[1] wrote: "As our microscopic knowledge increases we may arrive at some definite distinctive mark by which to recognize the disease," while ten years earlier J. Hughes Bennet[2] read a paper on "The more exact diagnosis of cancer by the use of the microscope," in which he said: "we are only on the threshold of inquiry. What may we expect when surgeons are more extensively assured of the diagnosis?" At this same period, 1850 and thereabouts, Rokitansky and Virchow definitely established cellular pathology and the pathology of cancer. Paget's *Surgical Pathology,* published in 1865, gives the minute anatomy of cancer practically as we know it today; while the method of transmission and metastasis to other areas is erroneously attributed to the blood stream.

During the latter part of the preantiseptic era other lesions which had not been considered to be true cancers, especially that condition known as cancroid, were gradually recognized as being of a genuinely cancerous nature. The earliest and most thoroughgoing emphasis upon the epithelial character of the cancer cell and the diagnostic importance of its minute anatomy by any English writer of renown, was made by Lawson Tait[3] in 1879.

It is interesting to note that long before Emmet's discovery of laceration of the cervix, the prevalence of cancer of the cervix in women who had borne many children and those having had many difficult labors, was not only known, but given almost universal recognition, and this explanation for the greater frequency of cervical cancer in Europe than in America is mentioned by more than one writer of the period.

As regards prognosis and treatment, it is also interesting to note the same occasional recovery after the use of some simple or bizarre remedy, and the same discrepancy of opinion as to whether any case actually made a permanent recovery that we find at present; the pessimistic note gradually diminishing towards the end of the era.

Dewees[4] in 1847, says that "Our duty in the treatment of uterine cancer is to mitigate suffering which we cannot remove." Tait, *ibid,* in 1879, said of cancer of the cervix that it is "the most painful and terrible disease from which mankind suffers, because nothing can be done for its cure" and that he "has never had a cure."

Emmet[5] in 1884 said: "When at the time of operation no doubt existed as to the character of the malady it always returned."

Other writers mention an occasional cure running over a two year period, an inadequate time as we understand it today; but this men-

tion of what we would consider uncertain cures, grows more and more frequent as operative procedures became more common and less dangerous.

During this period, also, we see a gradually increasing effort at more radical extirpation; a wave of enthusiasm for each procedure being succeeded by revulsion of feeling as improved results failed to materialize in the hands of any one aside from its sponsor.

It is difficult to avoid undue and untimely philosophizing when considering the methods of treatment in use and "there is nothing new under the sun" occurs to one's mind over and over again. Thus early writers contended that low diet and local and general venesection prolonged life. In 1842 Montgomery[6] quite accurately described as an early type of cancer, what we now regard as laceration with cervicitis and hypertrophy, which, he said, should be treated by local blood letting and the application of nitrate of silver. Douches of chloride of lime solution were recognized as efficient deodorizers in advanced cases with fetor.

Byrne,[7] in 1871, reported a case in which he was unable to apply his galvanocautery loop and in which a cautery knife was used instead; while Courty[8] in 1882 advocated amputation with a peculiar shaped cautery knife made by Colin of Paris, the vagina being protected during its application by a box wood speculum.

Noeggerath[9] in the discussion of Byrne's paper fifty years ago, announced his conviction that radiating heat destroyed cancer cells beyond the point of application and thus prevented recurrence.

From the time of Osiander's demonstration, amputation of the cervix, as a definitive method of treatment for cancer, easily maintained its supremacy throughout the preantiseptic era. Performed at first with knife, scissors or écraseur, the operation was greatly improved by the introduction of various types of galvanocautery loops and knives.

Marked palliation of symptoms and, occasionally, a permanent cure, can be said to have been the result of amputations until the time of Byrne who, first with the galvanocautery loop and later with cautery knives and dome-shaped irons, established a record which surpassed anything previously known. As early as 1871, he was enabled to report several cases without recurrence after from six to nine years.

Vaginal hysterectomy began also to have its advocates; but vaginal hysterectomy was endowed with a peculiar fatality for many years after its introduction, especially if performed with the uterus *in situ*, while the death rate was low if the uterus was prolapsed or inverted. Indeed, these two conditions were considered to be the indications *par excellence* for the operation. Until 1830, there were but ten authentic cases of removal of the uterus, per vaginam, and the operation was called the most serious and painful in surgery. The editor of the *Medico-Chirurgical Review* remarks at this time, "We consider the

extirpation of the uterus, not previously protruded or inverted, one of the most cruel and unfeasible operations that ever was projected or executed by the head or hand of man."

Thus the dangers were so great that, in 1856, but 25 vaginal hysterectomies had been performed, with 22 operative deaths and three recurrences. In 1863, Sir James Y. Simpson[10] said that "excision of the uterus is an unthinkable procedure at present;" and, in 1882, Courty wrote that "extirpation of the entire uterus and supravaginal cervix were common enough at one time to afford material upon which to base a serious opinion as to their advisability. Only the infravaginal cervix should be amputated and with this some cures result."

The decade 1880 to 1890, was marked by a renaissance of vaginal hysterectomy following the lead of numerous German surgeons abroad and Fenger in America.

This same decade saw a decline in abdominal panhysterectomy which had been taken up by a number of European surgeons of note, following Freund's[11] report, 1878, of ten operations with but five deaths. Despite this mortality, some operations continued to be performed; but vaginal hysterectomy was, at this time, so much safer that the surgical profession continued to lean towards it despite the high percentage of recurrence.

During this decade and, indeed, until his death, Byrne continued, as pointed out by Werder, to be as one crying in the wilderness, and at the time of his death he had nearly 400 cases to his credit without an operative death and with a 19 per cent permanent recovery rate.

It is assumed that all of us are more or less familiar with the situation as it existed from the beginning of the antiseptic era until the complete development of the Wertheim operation and the publication of his studies[12] in this country in 1907, from which may be said to date the general, although by no means universal, adoption of this method of operating for cancer of the cervix.

In this era vaginal hysterectomy continued to lead other operative procedures, and the mortality was continuously lowered; but, at the same time, the safety of all abdominal operations was almost unbelievably increased through the practice of surgical asepsis. Ovariotomy, salpingectomy and hysteromyomectomy, heretofore approached with great apprehension, became so safe that recovery was anticipated as a matter of course. In view of this it is not strange that the improved results from more extensive operation and glandular excision in cancer of the breast, called the attention of several operators to the possibilities inherent in a more radical extirpation of the periuterine structures and pelvic lymph glands, so that Mackenrodt, Rumpf, Ries and Clark, in 1894 and 1895, independently evolved methods which differed somewhat in detail but not in principle. In 1898, Werder[13]

published his method of total removal of the uterus with a large portion of the vagina, and in the same year Wertheim began the study which eventuated in the operation bearing his name.

The complete development of the Wertheim operation seems to have been brought about by serial studies of the iliac glands together with a knowledge of the high ratio of local recurrence after vaginal hysterectomy. Wertheim's appearance in this country, with the publication of his statistics to date, was but the culmination of a series of events which gave the Wertheim operation its widespread vogue.

In his Chicago address, Wertheim reported 345 operations (about 50 per cent of all the cases applying for treatment). Especial attention is directed to his assertion that his early mortality was 18 per cent following a 2 to 2½ hour operation, while he was able, later to reduce this to 8 per cent for the same operation if its performance did not require more than an hour.

From 1907 to the present may be considered the Wertheim era, although Schauta continued to contend valiantly for his extended vaginal method during the early years of the epoch.

In order to obtain a correct perspective of recent developments, the introduction of statistics becomes necessary despite their known unreliability.

Fortunately modern methods of microscopic diagnosis remove one element of uncertainty in that, practically, all cases reported as cancer of the cervix are that and not something else, so that the greatest element of uncertainty does not pertain so much to the percentage of cures as to the stage which had been attained when the cure resulted, the percentage of operability reported running all the way from Clark's estimate of only 10 per cent, applying to the University of Pennsylvania Clinic, up to Graves'[14] latest figures of 64 per cent. Obviously the difference between these figures represents a difference in the material seen by each and, probably, also a different viewpoint as to what does and what does not render a case inoperable.

One may consider operation worth while even though permanent cure is improbable, while another may be taking a very broad view of the community and sociologic aspect of an operation, which, although an improvement on what has preceded it, still has so disastrous a general mortality and recurrence rate, as to frighten prospective good operative risks, thus leading them to delay examination and treatment until they, in turn, become poor operative risks; the whole constituting what might be termed a sociosurgical vicious circle. Of the writers consulted, Clark alone seems to emphasize this broad humanitarian viewpoint. Moreover the value of statistics depends upon the relation between the constant and the variable factors: When the known constant factors remain the same, multiplication of numbers tends to average the variables and leads to increasing accuracy,

so that case reports running into the thousands mean something rather definite, while a few may mean much or nothing.

A comparison of results as between vaginal and abdominal hysterectomy for cancer during the past ten years would be unfair to vaginal hysterectomy, since most surgeons now choose the latter in obese patients or those obviously unable to bear the shock and hemorrhage of the abdominal operation, the bad risks, while a comparison of the two in 1900, let us say, would be unfair to abdominal hysterectomy which then was in a state of earlier evolution than the vaginal operation. A comparison of the results when each operation may have been said to be at its acme, however, is not unfair; and, counting the available statistics, gives the following results for vaginal hysterectomy: Operability 37 per cent, operative mortality 4.5 per cent; five year cures 28 per cent; absolute cures, per one hundred applying for treatment, 12.5 per cent.

Applying the same method to the Wertheim operation, Janeway[15] completed the following figures. Of 5027 cases 35 per cent were operable, operative mortality 18 per cent. Five year cures 35 per cent; absolute cures, per hundred applying for treatment, 12 per cent.

A comparison of these two sets of statistics is interesting. Operability rate is nearly the same, the absolute cures are almost identical. The superiority of five year cures from the Wertheim operation, being figured on survivors of the operation, is offset completely by the greater number that succumb to this operation as compared to vaginal hysterectomy.

Some smaller but later sets of statistics serve somewhat to dissipate the gloom produced by a comtemplation of figures which appear to show that we have not succeeded in advancing very far even with the aid of what may be termed a super-major operation.

Thus Lincoln Davis[16] gives, in 64 cases, an operable rate of 42 per cent; mortality rate, 11 per cent; five year cures, 42 per cent; absolute cures, 8 out of 64, again 12.5 per cent. Graves[14] reports 64 per cent operable out of 189 cases or 119 operated upon with a 5 per cent mortality rate; and Cobb, in his last 30 cases, had the same mortality rate with an average of absolute curability of 18.5 per cent. Weiss[18] in 1918, reporting on the Werder operation, gave 25 per cent operability, 6 per cent mortality, 45 per cent five year cures, making 11 per cent absolute cures. Faure[19] says he has treated 71 by abdominal hysterectomy, 50 per cent free from recurrence; but adds that of "early cases 88 per cent survive, of late, 27 per cent."

In contemplating the subject and reading the available literature two things stand out with great distinctness. First, the mortality rate goes down with increasing experience. Thus many writers refer to their last thirty, or fifty, or one hundred cases when stating the pos-

sibilities inherent in the Wertheim operation. Second, the operative recovery rate and freedom from recurrence are enormously increased by early diagnosis and early operation. Of the importance of the latter all of us are aware and it is not my intention to go into this phase of the subject on this occasion.

Though the data do not justify so high an operability rate, so low a general mortality rate, nor so high an absolute curability rate, let us observe, in liberal round numbers, what has happened at the expiration of five years to 100 women with cancer of the cervix, if 50 per cent were operable; there was only a 10 per cent mortality rate, and 20 per cent of absolute cures. Out of 100, twenty are now well; fifty inoperables have gone on and died, all presumably having had a Percy cautery. curette and cautery, or some other form of local treatment; five of the fifty operated upon died at once, and the remaining twenty-five died from a recurrence. Of the fifty who underwent a tremendously severe painful operation, thirty were dead within five years. Were the operation less serious, less heroic, and less frequently complicated by postoperative sequelae, such a showing might be justifiable; but with the reverse true, it, in my opinion, lacks justifiability when performed upon the present indications of operability.

The Present Era.—Cobb[17] says: "It is absolutely certain that radium and cautery cannot cure cancer of the cervix." Between this and the opinion of ardent radiotherapists, there is room for a wide difference of opinion, opinion which must be based upon impressions rather than large arrays of statistics, since radium has been used extensively and intelligently for too short a period to permit the completion of conclusive statistics.

Allowing for the exaggeration which attends every new method, the legitimate and illegitimate enthusiasm attaching to any new operative painless treatment, utilizing so mysterious a force as radium, there still remains the fact that radium has been used in a sufficient number of inoperable hopeless cases with results so startling as to make us pause; and, on reflection, question whether bloody means ever are justifiable in cancer of the cervix, and if so, when?[20]

That Cobb's statement is extreme,[21] and that radium does sometimes cure cancer of the cervix, can be proved by a limited number of cases in the records of many surgeons and radiotherapists. Personally, I have one with no recurrence after seven years following cautery amputation and radium; but it is the apparent cure of a considerable number of inoperable cases extending over two, three, four, and five years that makes it impossible to rule radium out of the field. Thus Burnam reports 30 patients without recurrence out of 200 treated by radium more than five years ago, and these were either borderline or inoperable cases. If only we knew whether late recurrence was ren-

dered more likely after radium than after the knife, we would have some definite data for comparison; but of this we are not certain. We can at least conceive that living carcinoma cells may be imprisoned in the mass of connective tissue, left after the use of radium, to again become active many years later. That postoperative sequelae do occur after radium treatment, is well known; that an occasional death may result from overradiation in an advanced case may be granted; but there is no perceptible mortality rate in cases which are operable when measured by our present standards.

From a careful personal observation and checking up of my own results, and taking into consideration all the concomitant circumstances, I have been gradually driven to certain conclusions but, before putting them before this body, I felt it wise to obtain the opinions, pro and con, of a few distinguished authorities with much greater experience than my own, who are not members of the Association and, therefore, would not be present to give their personal views in the discussion.

Accordingly, letters were sent to W. J. Mayo, Reuben Peterson, John G. Clark, and Howard C. Taylor, asking them to criticize, favorably or unfavorably, the thesis that "Only such cases of cancer of the cervix should be submitted to the Wertheim operation, as are discovered so early in the course of the disease as to require the microscope for a positive diagnosis." At the time these letters were written the papers of Clark and Keene,[22] Schmitz,[23] and Duncan[24] had not been published. If they had been available, Clark's opinion could have been obtained by quotation from his paper rather than by personal solicitation; and Schmitz's statement would have been presented earlier in the present discussion since it so accurately corresponds with my own experience. This paragraph of Schmitz is as follows: "In my experience, almost all the patients that survived an operation for carcinoma for the customary five year limit had been either subjected to a panhysterectomy on account of unexpected microscopic findings or the recurrence and persistence of the underlying pathologic process after minor surgical procedures instituted for the correction of apparently benign disease," whereas I had endeavored to put the matter concisely by stating that in those who survived, the discovery of malignancy had been accidental.

Concisely stated, cancer of the cervix was practically hopeless until the introduction of the galvanocautery amputation by Byrne. Unfortunately this was not widely adopted and the results obtained by vaginal hysterectomy, when that operation was fully developed, were probably superior to cautery amputation alone. Certainly it was more extensively used so that many more cures resulted.

Panhysterectomy, by the Wertheim method, has in general no higher

rate of absolute cure than the vaginal operation; but in the hands of the most expert it is, probably, superior to vaginal hysterectomy. All of the major operative procedures, performed upon the ordinary indications of operability, leave so large a proportion untreated, have so high a mortality rate, and such a large number of recurrences, as to have a profoundly bad effect upon what may be termed the community surgical morale; and, therefore, I wish to present the following theses for discussion, all but the first being offered in the hope of standardizing our procedures, as well as in the belief that more cures will be effected than at present.

CONCLUSIONS

1. Any expectation of an increased number of cures of cancer of the cervix by surgical methods must be based upon earlier diagnosis.

2. Panhysterectomy should be reserved for cases in which a positive diagnosis can be made with the microscope only.

3. The parametrium being free so far as digital examination can determine, but the case far enough advanced to be diagnosed, clinically, a high cautery amputation of the cervix, followed by radium treatment, offers the greatest hope of cure.

4. The advanced, surgically hopeless case should be treated by radium rather than with the knife, curette and cautery, chemical caustics, or Percy cauterization, unless profound toxemia or serious infection contraindicates local interference of any kind.

The replies to my letter were as follows:

"In reply to your letter of July ninth, asking my opinion as to the position you are about to take on the question of the diagnosis and treatment of cancer of the cervix, I will say that I am afraid that I cannot agree with you.

"I have nothing against the use of radium, although I have no personal experience with it. However, you must remember that comparatively few men have enough radium to carry out such treatment. Cancer of the cervix is widespread and should be seen and treated by many surgeons. The greatest good will result, in my opinion, where cases of cancer of the cervix are seen early by the surgeon and subjected to radical surgical treatment. The poor results of the radical operation came from unfamiliarity with the technic and subjecting too far advanced cases to the knife. However, many cases which can be diagnosticated as cancer of the cervix by inspection and palpation can be cured by the radical operation. This does not mean that every case should not be checked up by the microscope. But the criterion of surgical treatment for carcinoma of the cervix diagnosticated by the microscope *only* in my opinion is not broad enough.

"Have you seen Graves' last article? His work, that of Cobb, and possibly my own show what can be accomplished by the radical operation. It only remains for surgeons to strive to have the patients come to them early and to operate only upon these early cases.—*Reuben Peterson.*"

"Relative to your question as to when to apply the radical operation in cancer of the cervix, I would say that I have almost reached the point where I believe radium is the best treatment for all cases regardless of the extent of the lesion. During the last year we have operated upon very few cases; so few, indeed, as to

make our statistics almost negligible. I cannot help but feel, therefore, that when we consider the remarkably good results in inoperable cases which follow radiation, the very early case ought to respond infinitely better. I do not feel, however, that I have quite reached the point yet where I am able to take the stand squarely in favor of radiation alone; but I have so nearly come to this point, I very seldom do a radical operation.—*John G. Clark.*''

''I have your letter of July 9 in regard to the use of radical (Ries, Clark, Wertheim) hysterectomy for cancer of the cervix. The Wertheim type of operation has today only a very small field of usefulness. Personally, I have not done one in three years. Radium is taking the place of the extensive operation for the cure of carcinoma of the cervix with the exception of very early cases and it is possible that it will soon be the method of choice in all cases, either alone or combined with operation. For carcinoma of the body of the uterus, total hysterectomy is the operation of choice.—*W. J. Mayo.*''

''I do not go so far as your letter would indicate in the use of radium instead of operation for carcinoma of the cervix uteri. There is no question that all of us have changed our ideas with regard to the cases that are operable, but personally I would prefer operation in a case in which carcinoma is limited to the cervix with no involvement of the vaginal walls or the bases of the broad ligaments.

''It is my custom if the growth seems limited to the cervix to first make an application of radium (100 milligrams for twenty-four hours) and then to wait for two weeks. At the end of that time I do such hysterectomy as the case seems to indicate. If the patient is in good condition and is a good operable risk I would do a radical abdominal operation. If the patient is not in good condition I would be satisfied with a less extensive hysterectomy.

''The only theoretical objections to this plan are the risk of the operation and the theoretical possibility of liberating some live cancer cells by the operation which have been encysted by the action of the radium. I consider that the risk of the operation is a very small one. Selecting only favorable cases the mortality from the radical abdominal operation is small. The risk of cancer cells which have become encysted ultimately causing trouble seems to me to be considerable. For these reasons I still consider that there is a definite group of cases that should be operated upon and that this group is more extensive than your letter would indicate. There is another group of cases on which I operate though I appreciate that I may be wrong in doing so. I refer to the class of cases that are inoperable when first seen on account of extension to the vaginal walls or to the bases of the broad ligaments but which become operable, that is, any induration extending outside of the uterus is removed, by the application of radium. On these cases, assuming that they are favorable operable risks, I still do a hysterectomy. I have in mind one case in which the growth had extended upward into the fundus of the uterus to such an extent that it was well away from reach of radium and in my judgment beyond doubt carcinomatous tissue was removed by the operation that would not have been cured by radium alone.

''I appreciate that many of our best men have largely given up operations in these cases and are relying entirely on radium. I think only time can decide which course is the better to follow. That great benefit is derived from the use of radium is beyond question but I have not given up operation for cancer of the cervix uteri. —*Howard Canning Taylor.*''

REFERENCES

(1) *Churchill*: Diseases of Women, 1857. (2) Am. Jour. Med. Sc., Feb. 3, 1847. (3) *Tait, Lawson*: Diseases of Women, 1879. (4) *Dewees, W. P.*: Treatise on Diseases of Females, 1847. (5) *Emmet*: Principles and Practice of Gynaecology,

1884. (6) Am. Jour. Med. Sc., July, 1842, iv. (7) Tr. of Am. Gynec. Soc., 1877. (8) *Courty*: Practical Treatise on Diseases of Uterus, Ovaries and Fallopian Tubes, 1882. (9) *Noeggerath*: Tr. Am. Gynec. Soc., 1877. (10) *Simpson, Sir James Y.*: Clinical Lectures on Diseases of Women, 1863. (11) *Freund*: Centralbl. für Gynäk., 1878, pp. 497-503. (12) Surg., Gynec. & Obst., Jan., 1907. (13) Am. Jour. Obst., 1898, xxxvii. (14) Surg., Gynec. & Obst., June, 1921. (15) Surg., Gynec. & Obst., Sept., 1919. (16) *Davis, Lincoln:* Surgical Clinics of North America, June, 1921. (17) Jour. Am. Med. Assn., Jan. 3, 1920. (18) Am. Jour. Obst., Dec., 1918. (19) Jour. Am. Med. Assn., Feb. 12, 1921. (20) *Percy, J. T.*: Jour. Am. Med. Assn., Mar. 19, 1912. (21) Bull. Johns Hopkins Hosp., Dec., 1913. (22) Jour. Am. Med. Assn., Aug. 20, 1921. (23) Jour. Am. Med. Assn., Aug. 20, 1921. (24) Jour. Am. Med. Assn., Aug. 20, 1921.

VALUABLE METHODS USED TO EXTEND OPERABILITY IN ADVANCED CANCER OF THE CERVIX

By G. Van Amber Brown, M.D., Detroit, Mich.

THE history of cancer is as old as that of medicine. Up to the present its cause is unknown with the mortality alarmingly on the increase, so that, today, one out of every eight individuals dies of this malady, and one wonders whether we are not facing the danger of extermination of the race by its ravages. The mortality is about equally divided between men and women, there being eleven men to every thirteen women. It is most interesting to note that, in the past twenty years, the mortality of tuberculosis has decreased 30 per cent, while that of cancer has increased 30 per cent. The death rate, in this country, shows that, in the last five years, while radium and x-rays are being actively exploited as the treatment *par excellence* for cancer, the annual increase in mortality is from 2 to 3 per cent. Such a mortality exists in New York City where x-rays and radium are, probably, used more than in any other medical center; and in this same city in the last year, the death rate of cancer far exceeds the death rate of tuberculosis. Carcinoma of the cervix constitutes about one-third of the cases of malignancy occurring in women. Statistics from the American Society for the Control of Cancer show that in the year 1918 there was, in the United States, a mortality of 11,965 from uterine cancer. Reports from the various clinics throughout this country show that in the cases of carcinoma uteri presenting for treatment, from 60 to 90 per cent were inoperable when first seen.

It is not my intention, at this time, to discuss the etiology or symptomatology of this malady. I wish only to speak of two methods which greatly extend the operability in advanced cancer of the uterus: (1) the "Starvation Ligature," (2) radiotherapy. It is not known who first employed the starvation ligature; but ligation of vessels for control of hemorrhage is mentioned in the writing of Celsus (30 B.C. to 50 A.D.), and of Galen (131-211 A.D.). The ligation of arteries is said to have been practiced at least 1800 years before Harvey discovered the circulation of the blood (1616-1619). With the discovery of the circulation and the development of knowledge concerning a part played by the blood in the nourishment of normal as well as abnormal tissue, the method of ligating arteries increased in scope. It then came to be applied not only for the control of hemorrhage, but for the purpose of causing atrophy of organs or other parts of the body, and to lessen the nutrition of inoperable new growths, thus checking their further development and often causing their disappearance.

The last named use of the ligature has given rise to the term starvation ligature. It has been said that Johann Muys, in 1626, recommended the starvation method by means of arterial ligature. However, the discoverer of the circulation of the blood is credited with originating this method, which procedure he used in 1651, when he is said to have treated successfully a case of elephantiasis of the scrotum and testicle by ligating the spermatic artery. It is recorded that, in 1707, Lange employed it in the treatment of goiter. A hundred years elapsed before the method was again employed when, in 1809, Travers employed it in a tumor of the orbit. Since then its field of usefulness has been gradually extended, so that the procedure has been applied to the tongue, thyroid gland, spleen, buttocks, prostate, testes, ovaries, uterus and other parts of the body. Neither in the earlier days of its use, nor in later times, has the method received the attention it merits.

During the latter part of the last century Dr. John A. Wyeth of New York, reported 789 cases of ligature of the common carotid, of which 95 were for malignant tumors of the orbit, and 91 cases of the external carotid alone were tied to relieve, or cure, so-called malignant growths. He also analyzed 18 cases of ligation of the internal carotid. He gives no statistics upon starvation ligature as applied to the internal carotid alone, and from his other cases nothing reliable can be deduced as to the practicability of this operation; though this procedure was used about the same time by many others, both in this country and in Europe, it was not until the appearance of an essay by Samuel D. Gross, "The Treatment of Certain Malignant Growths by Excision of the External Carotid," by Robt. H. M. Dawbarn, that the starvation ligature became the modified "starvation treatment," which is now an established procedure in the treatment of advanced cancer of the mouth, the face, and of the uterus. In cancer of the cervix, Fritsch was the first to use tying of the uterine arteries. In 1888, Baumgarten was the first to use it in inoperable cancer of the uterus. Howard A. Kelly, in 1893, was the first to ligate the internal iliac, which was done in an emergency on account of a violent hemorrhage that occurred during the operation. Afterwards it was used by him as a method of choice, as was also done by Pozzi and many others. Later, Bainbridge from a seven years' experience, reported in 1915, 48 cases of ligation of the internal iliac, mediosacral, and ovarian arteries, for malignant disease of the uterus. In two of his cases he ligated the common iliac with satisfactory results. In another case both common iliacs were ligated.

We will now turn from the starvation ligature to a consideration of radiotherapy and then to the use of the two jointly. In 1792, George Adams, mathematical instrument maker to His Majesty, and optician to his Royal Highness, the Prince of Wales, reproached the medical profession for lack of tenacity of purpose in its use of electricity, at

the same time, forecasting the history of electrotherapy as applied to cancer at the present time. Adams declared that electricity had considerable scope for action in surgery, in tumors, particularly of the glandular type. In glancing over the literature of the electrotherapeutic treatment of cancer, the prophetic insight of this observer is borne out one hundred and thirty years later. What applies to electrotherapy is equally true of its concomitant, radiotherapy. Radiotherapy includes radium, x-rays, and the radiant energy of heat.

The x-rays, discovered by Roentgen in 1895, were first employed in the treatment of malignant disease. The history of the use of the x-rays from then until now again verifies the prophecy of Adams. In 1913 Sir Malcolm Morris in the preface of the first treatise on radiumtherapy (Wickham) expressed an opinion parallel to that voiced by Adams in 1792, with the result that, today, the use of radium has verified this prophecy. Radium and x-ray have a selective action, producing masses of bundles and bands of scar tissue which may delay the advance of the growth; but they make late subsequent operation difficult and often ineffective. Heat prevents progress of the cancer and does not interfere so seriously with late secondary operative procedures.

Five hundred years ago Guy de Cheulic, though he used the knife in cutting out cancer at an early stage, recommended and used in growths, particularly of the fungus type, the actual cautery. The electrocautery introduced by Middledorpf, crude as it was, was considered by many surgeons as preferable to destructive chemical agents in the treatment of uterine cancers. This method was later adopted by John Byrne, of Brooklyn, who (1892) gave his first paper in the use of the galvanocautery in cancer of the cervix. This he used in doing vaginal hysterectomy and high amputation of the cervix. The method, later improved upon by him, came to be known as the Byrne method.

In recent years, J. F. Percy developed a technic for the use of moderate heat in treatment of advanced cancer of the cervix. As he calls attention to the point that by his procedure there is in no sense a burning or cauterization of the parts, for this, according to Percy, only defeats the effort to get a maximum penetration of heat. To quote Percy: "Experimental work has shown that a low degree of heat has a much greater penetrating power in a mass of cancer than has a high degree. High degrees of heat carbonize the tissues, inhibiting penetration. Low degrees of heat coagulate the tissues, encouraging heat dissemination. High degrees of heat, with a resulting carbon-core, prevent drainage in the cancer mass. This prevents in a certain number of cases the absorption of an excessive quantity of broken down cancer cells, which are dangerous to the life of the patient.

When the temperature in the heating iron is the right degree for the greatest penetration, its shank can be wrapped with cotton and remain there for forty minutes or more. The color or texture of the cotton will not be altered in any way by this degree of temperature, and this merely emphasizes the fact that a burning temperature is not used."

W. J. Mayo calls attention to the point that, for a certain distance, cancer cells are killed and that at a greater distance they are sickened or sterilized by this method, that is, they have lost their ability to reproduce and, before the recovery of the latter is the most favorable time for the radical operation hysterectomy.

Percy states that his work is based on laboratory experiments, which show that the cancer cells cannot be successfully transplanted after an exposure of 45° C. for ten minutes, while normal tissue cells can stand a temperature of from 55° to 60° C. without being devitalized. Doyen, a number of years before Percy, experimented to determine the thermal death point of cells and came to the same conclusions. Doyen also showed that cell destruction is the result of tissue coagulation, and, that it is possible to coagulate tissues to a depth of five to eight centimeters in from one to two minutes by diathermy.

The normal cell has three periods of existence; growth, function, regeneration for purposes of growth. During the period of function, reproduction is most active. The malignant cell has no period of function; its entire reproductive activity is thrown into the first stage, and only embryonic cell growth is produced. The normal functioning cell, as a part of the community life, is protected by the entire organism of which it is a part. The nervous system, the blood supply, and the lymphatics are all a part of this mechanism. The malignant cell has no such protection, hence it is five times more vulnerable than the normal cell and is treated by nature as a foreign body. Malignancy is the property of the cell; the stroma is not a part of the neoplasia, but is a measure of nature's defense. Therefore, since the malignant cell is five times more vulnerable than the normal cell, it is not hard to see that, by cutting down the blood supply by ligature and still further lessening it by sealing the smaller vessels with heat and, also, through the heat produce increase of connective tissue which further protects against the ingress of the malignant cells, we may by this method completely destroy them, still leaving enough blood to the parts to nourish the normal cell.

Then, too, if not supplemented by the starvation ligature, radiotherapy often fails in the destruction of the malignant cells when their nests are in or near the blood vessels from which they draw sufficient nourishment to withstand its effect.

As regards the value of combining the heat with the starvation ligature method, it has been extensively tried out in this country, and though opinions vary considerably, the most reliable evidence is in

its favor. The most complete report on the use of the method has been made by Smith, who records 100 cases treated at the Mayo Clinic. Of these it was possible later to perform a radical extirpation of the uterus in 26 cases; the time chosen for the hysterectomy being about four weeks after the heat treatment. In 19 of the 26 cases operated on, no carcinoma was found in the specimen removed at the final operation. Smith's results compare favorably with, if they do not surpass, the best reports from the use of radium in the same class of cases.

I wish here to supplement this report by giving briefly results obtained in a series of eight cases.

1. Case No. 3568, housewife, age thirty-five, weight 150 pounds, multipara, metrorrhagia for two months, constant bleeding, many large clots. Tissues bleed freely upon careful examination. Cauliflower growth of cervix. Operation, August 6, 1921. Ligation of both internal iliacs and ovarians. Heat applied. Recovery uneventful. Left hospital end of third week. Cervix is normal in appearance except that the canal is larger than normal and the surrounding mucous membrane pale.

2. Case No. 1479, housewife, age forty-six. Had 11 children; no instrumental deliveries; no previous operations; menopause two and a half years ago. Present complaint: For six weeks has been bleeding almost constantly, never profuse. Diagnosis carcinoma of cervix not confirmed by laboratory. Operation: March 30, 1921, Percy heat applied for one hour. Patient left hospital the fourth day. Has since been in good health.

3. Mrs. L. B., housewife, age forty-seven, mother of four children; normal deliveries; laceration of perineum and cervix with first. Chief complaint: Bleeding from vagina; pain in pelvis, back and legs. Physical examination negative, except cervix. Three excavating ulcers, the largest about the diameter of a dime. Bleed upon touch. Feb. 3, 1921, radical hysterectomy was attempted but patient became profoundly shocked at the time the broad ligaments had been cut from the uterus. We hurriedly withdrew from the abdomen without completing the hysterectomy. Her immediate recovery was prompt. The patient refused further operative measures, but on Feb. 19, 1921, she returned. Under anesthesia a treatment of Percy heat was given. Following this, bleeding and pelvic pain ceased. Her condition locally was improved. The patient was, the third day, up and about. She gained in weight and color and was doing her own work until one month later, contrary to her physician's advice upon her own initiative, she had radium treatment. Within 8 hours after this pain became intense, accompanied by backache and bloating of abdomen and she has never been free from pain since, refusing all other surgical and mechanical intervention. (14 hours radiation, with 50 mg. radium.) There is now an extension to bladder, rectum, and sacral lymph nodes.

4. Mrs. D. S., age forty-five years, weight 220 pounds, present illness began in 1917, chief complaint was leucorrhea and increased flow at menstrual periods. Was advised to have operation at that time, but refused, and was not seen again until October, 1919, at which time she was confined to bed too weak to stand from loss of blood. She was white as parchment. Examination negative, except vagina revealed an old laceration of perineum. The vagina was filled with blood clots. The cervix was large and hard around the vaginal attachment. The os was crater like and the tissue broke down when examined and precipitated a fresh hemorrhage. Diagnosis: Carcinoma of the cervix, confirmed by microscopic examination. Heat and ligation of both iliacs and ovarians October 19, 1919. Results: Two weeks after operation

condition changed from fungating mass as large as an orange to what resembled a normal uterus two days after a four months' miscarriage. The patient, however, being a very fleshy woman, with deep abdominal fat, and very anemic, her R. B. C. less than a million and a half, developed, evidently from her lowered resistance, a fat necrosis with infection about the abdominal incision resulting in general sepsis, and death at the end of a month.

5. Mrs. D., age forty-eight, weight 160 pounds, has had no miscarriages. Three normal births, youngest child twenty years old. Present illness: Menopause was regarded as normal until the middle of May, 1920, when bleeding became so profuse as to be alarming. Examination revealed old laceration of perineum. The cervix was hard and the os was filled with fungating material which broke down and bled freely when examined. Diagnosis: Carcinoma of cervix uteri. Pathologist's report of curetted specimen dated May 26, 1920, was, that condition was not malignant. August 28, 1920, the same pathologist was taken to her home and allowed to examine patient and take specimen for examination which he reported to be actively malignant. Operation was advised to which patient consented, but afterwards changed her mind and was not seen until March 10, 1921, at which time her condition was the same as before, only that disease was much more advanced. The cervix, at this time, filling the whole vagina and broke down when examined, bled freely. Operation: Ligation of both internal iliacs and both ovarian arteries plus heat, March 16, 1920. Results: Two weeks after cervix looked smaller and only anterior border looked unhealthy. Heat again applied April 4, 1921. Sept. 15, 1921, the uterus feels and appears like a normal senile uterus. The patient is perfectly well and is doing her own housework.

6. Case No. 235, Mrs. M. S., age forty-two, weight 155 pounds. Mother died of cancer of uterus; father died of cancer of liver. Personal history: Had abdominal operation, February, 1913, when left ovary and both tubes were removed, and a Gillian suspension done. Since then she has been well. Present complaint: Backache, slight bloody vaginal discharge and irregular menstrual periods. Friday, Feb. 4, 1921, on account of a chill, physician was called. A slight pinkish discharge has been present for some days. Also has abdominal pain and backache with sensation of fullness in bladder. Vaginal examination revealed a large very nodular mass filling upper portion of vagina with an area of induration extending toward the anterior vaginal wall, with a uterus that was somewhat, but not freely, movable. Diagnosis: Advanced carcinoma of the cervix uteri. Laboratory report, medullary mixed cell, basal and squamous, carcinoma of the cervix uteri. Operation: Feb. 9, 1921, Percy heat was used coupled with ligation of both internal iliacs plus crushing and ligation of upper portion of each broad ligament. The adhesions resulting from the previous operation were so extensive that a hysterectomy would be mechanically impossible. This patient made a nice recovery, leaving the hospital four weeks later. Since then she has had a series of x-ray treatments attacking the pelvis anteriorly, posteriorly, and laterally. From each of these treatments she always had a marked radiation sickness lasting for days. She has had one radium treatment which also was followed by a severe sickness for several days. No such reaction followed the use of the heat treatment. This woman was examined in my office within the past week. She says that she is well except that she has not fully regained her strength. She looks well; the cervix is normal, except that the contour is changed as is also the upper portion of the vagina.

7. Case No. 632C. House wife, age twenty-eight, weight 165 pounds, nullipara, denies ever being pregnant, has never been ill. Cause for consultation: First noticed bleeding five years ago. It is accompanied by pain. At first noticed a spot of blood on clothing, occasionally, three or four times a month. Some discharge before her periods; this has gradually been getting worse. About a month ago she took a great

deal of exercise, walking, climbing hills, and bathing daily. This seemed to make her bleeding worse. Has worn napkins daily for the past month. For the last two months she has had a yellowish discharge mixed with the blood, and of foul odor; probably pus. Vaginal examination reveals a fungus mass bleeding readily. Diagnosis: Advanced carcinoma of uterine cervix. Diagnosis by pathologist, from curettings: Medullary, basal celled type of carcinoma of the cervix uteri, actively growing. Consultation: Diagnosis concurred in and advice of consultant to abstain from operation as case is hopeless. Operation, August 16, 1920. Percy heat, coupled with ligation of both iliacs and both ovaries. Patient left hospital during third week after an uneventful recovery. Though no bleeding ever occurred after this operation, there was a small area about the cervical canal which was slow in clearing up. One radium treatment promptly disposed of this. I saw her in my office one week ago today. She is perfectly well. Now weighs 190 pounds, having gained 25 pounds since the operation. The cervix is healthy and she menstruates normally and regularly three days in each month.

8. Case No. 305. Housewife, age thirty-eight, has five children, last baby eight months old. Present illness: For over a year patient had noticed a slight bleeding between periods. Flowed twice while carrying last child. This occurred about the fifth or sixth month. Flow regular since birth of last child, except that during the last three weeks some clots passed. No pain or other disturbance associated with the bleeding. Patient otherwise well. Vaginal examination reveals a large round, hard, bleeding mass growing from the cervix and extending well out into the anterior and posterior vaginal walls. Vaginal examination, under anesthesia, showed further that the rectum is infiltrated with the growth, as is also the perimetrium. Infiltration is so extensive that the whole is as if it were set in masonry. Diagnosis: Advanced carcinoma of the cervix uteri. Prognosis: Case deemed hopeless. Pathologist's report, Jan. 22, 1920; early active, rapidly growing, medullary, squamous celled carcinoma of the cervix uteri. Since no other form of treatment seemed to offer any hope whatever, we decided to resort to the heat and ligature method. Operation, Feb. 18, 1920. Bilateral salpingo-oophorectomy, ligation of both internal iliacs, Percy heat. Just below the bifurcation of the iliacs was an enlarged and broken down lymphatic gland which was removed. Pathologist's microscopic diagnosis: Passive congestion and early atrophy of the fallopian tubes, cystic degeneration of the ovaries, and far advanced rapidly growing carcinoma in the extrinsic tissues. Recovery from operation was rapid and without incident. May 3rd, ten weeks later, examination shows that the indurated area is much lessened. The uterus is freely movable, general condition of patient good. No hemorrhage in six weeks. June 7, heat applied for forty minutes without anesthesia. Aug. 3, examination in the office shows no induration about the vagina or cervix, that the contour of the cervix is good. The tissues are smooth and gliding, the uterus small, the fundus forward and in a good position. The parts are normal in color except some slight thin scarring of tissue in the vault of the vagina. The woman looks well, has a ruddy complexion, has gained in weight, and states that she feels as well as when she was sixteen. Clinically, she is apparently cured. August 24, three weeks later, the condition is the same; at this time, by sharp dissection, a portion of the cervix was removed for microscopic study. This was followed, immediately, by another application of the Percy heat which was used for two hours. Pathologist's report: From this tissue which seemed to be normal, microscopic examination shows that there are still some growing cancer cells. Two weeks later it was deemed opportune to do the radical operation, which was done Sept. 11. Preceding the operation, cystoscopy was done and the bladder was found normal in appearance. In the abdomen we encountered broad extensive adhesions, binding the bladder and sigmoid to the uterus, these were freed with much difficulty. The uterus was small, the walls of the blood vessels appeared much thickened

and the lumen materially narrowed. It was noticeable that the uterus and broad ligaments were quite anemic. There was one lymphatic gland the size of a small almond taken from the left side near the cervix and between the folds of the broad ligament. A hysterectomy was done, going well out into the broad ligaments, including the upper portion of the vagina, using for dissection the cautery knife. Pathologist's report: Microscopic examination (partial). The specimen is labeled—uterus. Most of the areas appear to be distinctly contracting. This is less noticeable, however, in the smaller cell nests. All of the neoplastic tissue presents the general cell picture of degeneration in addition to being quite markedly swollen and blurred. The neoplastic tissue appears to have undergone more degenerative change than the supporting tissue. Histologically, there remains an open question as to whether all other cancer cells are devitalized. Diagnosis: Caloric and atrophic change in carcinomatous and uterine tissue following ligation of blood vessels and repeated cautery treatments. Later this patient was given a series of x-ray treatments. Each treatment was followed by a radiation sickness; other than this she has remained well. I received a letter from her husband within the last few days expressing to me their gratitude.

Of the eight patients every one has shown improvement locally. One died of sepsis. One in which ligation was not done, but heat used after uncompleted operation, improved locally and in her general condition, until later, when radium was employed. This was immediately followed by extension of the growth. One, the last, operated, has cleared up locally and is improved generally. Seven of the patients (87.5 per cent) are living, two (25 per cent) are improved, five (62½ per cent) are clinically cured. If no permanent cure has been effected, the relief from symptoms and prolongation of life, has made this work worth while. The purposes of this method are:—(1) To control hemorrhage which is sufficient to cause a constant drain on the patient's vitality or is so severe or frequent as to warrent fear of a fatal return at any time. (2) To facilitate the discharge of pus and necrotic tissue, also diminish the absorption of poisonous products. (3) To control the progress of the disease thereby lessening pain and suffering. (4) To render a later total extirpation possible. (5) That suffering may be lessened and life prolonged in many cases when all other methods have failed. (6) That in many apparently hopeless cases life may be saved and a clinical cure effected. Having observed these eight cases with as much precision as I am capable, coupled with a perusal of recent literature on the subject, I am prompted to offer the following as points that should be emphasized.

(1) The use of the starvation ligature mechanically accomplishes instantly in the blood supply what a study of a microscopic specimen of carcinoma shows nature is endeavoring to accomplish. (2) The vessels should be tied at two points with either kangaroo tendon or heavy catgut ligature, as finer catgut may cut the vessel wall and precipitate a hemorrhage. Between the ties the arteries are crushed to a ribbon. Absorbable suture is used to avoid, as far as possible, the irritation factor that will, undoubtedly, arise from the use of the nonabsorbable material. (3) In applying the heat the temperature

is kept at 122°-140°F. and the abdomen should always be opened so that the heating iron can be properly guided from the vagina through the cervix to the fundus. By so doing, not only is the iron properly adjusted, but the gloved hand of an assistant placed over the fundus is an aid in determining the amount of heat to be used, and the danger of injury to the bladder, rectum and ureter, with the formation of fistula, may be avoided and sealing of the smaller blood vessels and lymphatics accomplished. (4) Should one not care to depend upon the heat and starvation ligature, and extirpation of the uterus is to follow, it should be done as a thermocauterectomy between the second and fourth week before the sickened cells have recuperated, and before the deposit of scar tissue is sufficient to interfere seriously with operative procedures. (5) With no other method can the fixed pelvic structures be loosened and mobilized as by the heat and ligature. (6) Adequate x-ray and radium treatments cause a decided radiation sickness from which the patient does not fully recover for from one to six weeks, rendering a hysterectomy hazardous. Hence, in this respect the heat has advantage over the x-ray or radium. (7) (a) After surgical procedures have been completed, x-ray or radium, or both, may be employed to advantage as was done in three of my cases; (b) if hysterectomy is not to be done and the growth is well within the cervix, radium alone is indicated; (c) if involvement is broad x-ray, combined with radium, is used; (d) if hysterectomy had been done, then later x-ray is used if doubt exists as to whether all cancer bearing tissues have been removed or if there is a recurrence. (8) (a) Postoperatively to pursue a set course, without variations, is hazardous. As far as postoperative cure is concerned, we should individualize the carcinoma of the cervix. (b) Along with the details above mentioned, attention should be given to diet, fresh air, and other measures that will raise the general resistance of the individual. (c) Inattention to details will lead, as it too often does, to failure of cure and bring unjust criticism upon the method. (9) In advanced carcinoma of the cervix, heat and starvation ligature are methods that should precede a contemplated panhysterectomy. While x-rays and radium are useful postoperative adjuvants, they should never be used as preoperative measures.

REFERENCES

Bainbridge: The Cancer Problem, 1915. *Garrison*: History of Medicine, 1914. *McLean*: Surg., Gynec. and Obst., April, 1915, pp. 457-461. *Bernheim*: Surgery of the Vascular System, 1913. *Bulkley*: Medical Record, March 12, 1921. *Percy, J. F.*: Trans. Am. Assn. Obst. and Gynec., 1917, p. 97. *Graves*: Text Book Gynecology, 1918. *Balfour*: Mayo Clinics, 1916. *Saltzstein*: Modern Medicine, Oct., 1920. *Balfour*: Surg., Gynec. and Obst., 1916, xxii, 74-79. *Mayo, W. J.*: Surg., Gynec. and Obst., 1920, xxx, 1. *Balfour*: Lancet, 1915, xxxv, 347-350. *Duncan*: Jour. Am. Med. Assn., Aug. 20, 1921. *Bailey*: Am. Jour. Obst., Sept., 1919, p. 300. *Clark*: Ann. Surg., June, 1920, p. 688. *Schmitz*: Ibid. *Clark and Keene*: Ibid. *Stone*: Surg., Gynec. and Obst., June, 1921. *Graves*: Ibid. *Burrows*: Annual Reports of the Manchester Radium Institute, 1919.

THE CONTROL OF THE MORTALITY OF ABDOMINAL OPERATIONS FOR CANCER

By George W. Crile, M.D., F.A.C.S, Cleveland, O.

ON THIS occasion I wish to report the methods and management of operations upon that group of patients who constitute a large portion of the group of handicapped cases whose successful treatment taxes to the utmost the resources of the surgeon, namely, abdominal operations for cancer.

The two outstanding principles which we shall describe were developed as the result of experience in the war. These two principles may be briefly formulated as follows: I. Protection of the patient in advance of the emergency. II. Control of infection (a) by the separation of contaminated surfaces from each other; and (b) by prevention of the pooling of wound secretion.

I. *Protection of the Patient in Advance of the Emergency.*—To achieve this end all the restorative measures that would be employed after it is recognized that the patient's life is threatened are employed *in advance of the probability* of the advent of danger. That is, when an operation, the mortality of which according to general statistical reports is from 10 to 25 per cent, is to be performed upon a patient, the patient is given the benefit of all the restorative and protective measures *before the positive indication* for their use has developed. In other words, we utilize the principle of prevention in surgery, as the principle of prevention is employed in medicine.

We shall never know in how many of the cases in which we have applied preventive measures those measures would have been required; just as no one can say how many of the individuals inoculated against smallpox or typhoid would have developed either of those diseases without that protection. In either case the value of the preventive measure must be judged by the effect upon the gross mortality as established by mass statistics.

Thus, as we might say, we do not treat the patient but the probability. One may, at first, feel that a disadvantage to this plan appears in the fact that if all our protective and restorative measures are employed in advance of the emergency, there will be nothing left to be done for the patient should he "go bad." The answer is, that the emergency will rarely develop; and, as shown by our experience at least, the mortality rate of operations upon bad risk cases will be markedly reduced.

The specific application of this principle in bad risk cases requiring

resection of the stomach or resection of the intestine consists in (a) *the establishment of water equilibrium;* (b) *maintenance of a failing circulation;* (c) *psychic and physical rest;* (d) *completely anociated operation;* (e) *the application of heat.*

(a) *The establishment of water equilibrium* is secured before and after operation by subcutaneous infusions of novocaine $\frac{1}{32}$ per cent in normal saline (Bartlett). (b) If the *circulation* is feeble and in the presence of *anemia* a transfusion of blood is made before operation. This is repeated before, during, or after operation according to the requirements in the individual case. (c) *Psychic and physical rest* are promoted to the utmost degree possible before and after operation; morphine being given if it is required to assure the maintenance of the state of negativity. (d) *The performance of an anociated operation* means that in these cases the utmost precaution must be exercised to avoid further impairment of the internal respiration. Lipoid solvent anesthetics and complete surgical anesthesia therefore are contraindicated. The operation is performed under nitrous oxid analgesia and local anesthesia. (e) The internal respiration is promoted by heat and is markedly impaired by chilling of the viscera. During the operation therefore the exposure of the viscera is reduced to the minimum and, after the operation, heat is applied to the whole abdomen in the form of moist hot packs.

II. *The Control of Infection.*—It was long ago recognized in civilian practice, but was dramatically demonstrated during the war, that contamination may be prevented from going on to infection by preventing the contact of one raw contaminated surface with another raw contaminated surface, and by preventing the pooling of wound secretion. The control of infection is further promoted by the protective and restorative measures already described; for the greater the resources of the patient, the better the local defense.

The application of these principles in resection of the large intestine is accomplished as follows: The operation is divided into two stages. In the first stage by means of a colostomy or by visceral anastomosis, the fecal stream is diverted from the field of resection, so that there will be no danger of fecal leakage at the point of resection anastomosis. There is no doubt that in many cases it may be safe to perform the entire operation at one seance; but, on the other hand, if too great a chance is taken in an operation, it may be regretted, but the opportunity to save the patient cannot be returned.

After the preliminary operation every effort is made to increase the resistance of the patient. In attaining this end, the application of the general principles of restoration and the length of the interval before the resection is performed are varied according to the needs of the individual case. Generally, however, about a week elapses after

the preliminary operation at which the operability of the case has been ascertained and the fecal stream diverted from the field of resection. At the end of this period the patient is a much safer risk.

At the end of the resection, the technic of which is now so well standardized, a single layer, or at most two layers, of iodoform gauze are interposed between the contaminated raw surface areas. This is removed in from four to six days and the wound dealt with either by a similar redressing or by the intermittent use of Dakin's solution.

The restorative measures already described are used. If restoration lags, blood transfusion is given and even repeated several times. The dietetic and hygienic regimen employed in the treatment of tuberculosis aids the convalescence.

The protective value of these measures is strikingly illustrated by the fact that in my last 66 operations for cancer of the rectum and large intestines there has been but one death; while the mortality rate in operations on the stomach and the intestines has fallen to 2.6 per cent, the operability has been extended until no case is refused for operation unless anatomically inoperable; and the postoperative morbidity has been progressively diminished.

DISCUSSION OF THE PAPERS OF DRS. BONIFIELD, SKEEL, BROWN AND CRILE.

DR. GEORGE GELLHORN, ST. LOUIS, MISSOURI, (by invitation).—I rise chiefly to applaud the paper of Dr. Skeel. Hardly ever have I heard or read as excellent an exposé of the whole subject. I would like to make just one comment. In one of his conclusions Dr. Skeel suggests that in borderline, or inoperable cases of cancer of the cervix, the use of the thermocautery should precede the radium application. On the strength of a rather extensive experience gained at the Barnard Free Skin and Cancer Hospital in this city, I venture to say that by doing so one would deprive himself of a very valuable filter. No filter that we can devise in any way takes the place of the filter supplied by Nature, and by thrusting radium needles into the diseased tissues themselves, the latter will act as a very efficient filter.

On the other hand, if the tumor be removed by curet or cautery, there are very thin walls left between the cavity and the adjoining organs, and it was due to that practice that we had a number of fistulae in former years when we did just what Dr. Skeel advocates. Now that we eliminate all kinds of preliminary surgery, such fistulae have not occurred and the palliative result of radium has been even better than before.

DR. WILLIAM SEAMAN BAINBRIDGE, NEW YORK CITY.—The consensus of opinion today is that we have more careful dosage and deeper effects of x-ray, with more refined technic; radium is emphasized as a more important agent with better technic and larger dosage. The German school is divided into two very hostile camps; the first advocating that the x-rays should replace all surgery in cancer of the uterus and that, very soon, radium will be forgotten; and the second insisting that the combined method is the only worth while one, using the x-rays externally and radium internally. Sittenfield says that surgical work on uterine cancer is practically ended and that in ten years it will be superseded by the x-rays and radium. Others of our colleagues say there is nothing in these two agents to be hoped for. Hadley remarks

that surgery should be employed as heretofore, but with finer technic, and that x-rays and radium should be tried as aids to the surgeon.

Such papers as Crile's, and others, that we have heard today make us realize the difference between surgery and surgery. As the application and dosage of radium and the x-rays are being perfected, it is for the surgeon to prevent cancer by early surgery, while groping for its cause. It is important to eliminate scars and other contributory factors, and the duty of the surgeon is to dwell more upon the prevention than the cure of the disease.

Pinch, the head of the London Radium Institute, is an advocate of radium and the x-rays, and says that "surgery still holds its place, but radium, a pocket x-ray as it may be called, and the x-rays are on trial but seem to warrant the belief of their being great additions in the treatment of cancer of the uterus. However, the extreme views expressed by German observers, and recently by some Americans, are unfortunate, for the facts do not justify their conclusions and only bring discredit upon the whole problem before us. Remember that radium and x-ray may cause harm as well as good. Let us give them a fair trial. Let us not forget, while testing these things, that surgery is our mainstay."

The question of tying off the larger blood vessels has been discussed. In 1908, and again in 1911, I published papers advocating the starvation ligature and lymphatic-block operation, and in 1913 read another paper on the same subject before this Society. Why have we been so slow in taking up this procedure? Why not ligate and block even though radium and the x-rays are to be used? To ligate both internal iliacs, both ovarians, and the sacralis media, controls the blood supply to the pelvic organs, checks the local nutrition, and stops the rapid spread of the disease. I have cases living today, many years after operation, who are apparently perfectly well. Of course, most of the cases died, but they had been given relief from pain and hemorrhage for a time.

At Guy's Hospital they are doing the starvation ligature and lymphatic-block operation in many cases. Recently, I have seen uterine cases treated by starvation ligature by Brown of Detroit, who has had some admirable results.

Referring to Dr. Bonifield's paper, in connection with age, it is well to remember that it is not the number of years we live, but the age of the tissues as a whole and not the passing of the years which is the important factor in disease.

DR. JAMES E. DAVIS, DETROIT, MICHIGAN.—The body resistance may be divided into two types, general and local. The local is involved in the general. All of the speakers have referred to both types of resistance. I wish to call attention to the picture that one sees in the histopathology of these tissues. There is an acquired fibrosis, a change in the blood vessels, and lymph vessels; also a small round cell infiltration. There is some question as to just how valuable the small round cell infiltration is as a measure of resistance, but to my mind it is one of the most positive and reliable evidences of resistance. All of these conditions obtain in cases that are not treated, if the body is able to acquire the ideal of resistance. You may produce all these conditions by the use of slow heat, or radium, or the x-ray, making a replica picture of natural tissue resistance. The same picture is also produced if you deprive the tissues of their blood supply.

I cannot see why there should be many points of difference in regard to the treatment. It is only the problem of application of the treatment to the tissues involved —getting the penetration to the exact area involved in the cancer.

I want to speak briefly in regard to one of Dr. Brown's cases. It was my privilege to study carefully the tissue from one of the cases he has reported. It was interesting to find the occlusion of the blood vessels in all of the tissues involved, and also the cellular change. In many cells there was distention of the cell envelop, in other

cells extrusion of the protoplasm, while in some the protoplasm was completely demobilized. In places it was impossible to tell whether the cells were virile, without considering the difficult chemistry of the cell. It was interesting to note the depth of penetration and the change in the cell where the penetration was less deep than in other places. Hence the problem can be summed up in terms of resistance, and the application of the remedy to the most remote parts of the cancer growth.

DR. MILES F. PORTER, FORT WAYNE, INDIANA.—I do not know whether Dr. Bonifield's published paper will contain the statement I understood him to make regarding the possible danger of the publication of facts to the public concerning cancer or not. If it does I think it would be a great mistake for this Association to even seem to support the idea that the public should not know the things that we know regarding the early manifestations of cancer. We lose in the United States about 100,000 people every year from this disease. The increase of cancer has been great until the last year or two, when it has stopped, and it is the opinion of those who know that the reduction, together with the increase in the percentage of cures, that those two favorable changes are due to the fact that the public is coming to understand something more about cancer and presenting themselves to the doctor in time to be cured. I think it would be a great mistake for this Association to even seem to put any drag upon the movement which seeks to get these men and women to the doctor in time to be cured. If we can save 50 per cent of these people we can afford to haul out now and then a few fainting, neurotic patients—male or female.

DR. SKEEL (closing on his part).—It might be thought from some things that have entered the discussion that I had become a radiotherapist. This is not the case, however, as I remain a surgeon although I hope the day will not arrive when I shall be only an operator, and cannot use or advise the use of radium or the x-ray if they offer more hope for the patient than operation, just as I hope the day will not come that I can't listen to Dr. Crile's advocacy of physiological principles in surgery and follow such of them as appeal to my judgment. Also I trust the day will never come when I shall not think of the welfare of the patient as the primary consideration in determining what form of treatment shall be used.

I quite agree with Dr. Noble that radium is an unknown quantity, but such it will remain unless we study it sufficiently to determine its value. Instead of spending time in discussing this phase of the matter at length, however, I prefer to read these letters, since they are of greater value in elucidating the matter than anything I could say, the reading of which was prohibited by the time limitations set upon papers before the Association.

I do wish to insist, however, that we were discussing cancer of the cervix and nothing else.

All of us know the difficulties and dangers encountered in doing a radical extirpation for cancer of the cervix by any method, as well as the high mortality and recurrence rate; and for this reason one phase of the matter was emphasized, that which might be called its sociosurgical aspect, the ultimate effect upon society of unsuccessful operative procedures. For this reason, if for no other, we should in all cases, but the very earliest, abandon an operation which shows so low a final recovery rate and continue our search in other directions until such time as a more satisfactory and successful operation is devised for those plainly diagnosable by clinical methods.

DR. BROWN (closing on his part).—Recently I had a letter from William Mayo in reply to a letter I wrote him regarding their experience with the Percy cautery heat. His reply was that results had been entirely satisfactory in their hands, but as it was more cumbersome than radium, they were employing the latter oftener now only because of its convenience.

I wish to give you some opinions from men like Stone, Clark, Schmitz, Graves and others, to tell the other side. William S. Stone of New York (Surg., Gynec. and Obstet., June, 1921) from observations in over four hundred cases says: "On account of lymph node involvement in certain cases of cancer of the cervix, radium cannot entirely supplant operation in all such early lesions. A strong plea is made to avoid treatment of primary cases that are too far advanced." He further states that the chief error in the use of radium seems to be an overdosage, with the subsequent disastrous results to the neighboring tissues.

Bailey, in a recent article, deals with 336 cases. He says that practically all cases that have a complete radiation of the local lesion and the lymphatics and other involved tissues, pass through a period of improvement, disappearance of ulceration, lessening or disappearance of discharge, gain in weight, and improvement of health are secured in all but the advanced conditions. After a longer or shorter time of well being, many of the cases have further development of cancerous tissue behind the vault of the vagina.

Burrows (Annual Reports of the Manchester Radium Institute) states that among 363 cases of carcinoma of the cervix of the uterus that were treated by radium, most of them were inoperable, 10 per cent showed a complete disappearance of symptoms and signs, but at least one-half of them recurred in twelve months.

Clark and Keene (Jour. A.M.A., August 20, 1921), in a list of 313 cases treated with radium, state that in eleven cases, which were advanced when treatment was given, the patients are dead. Also that irradiation is dangerous immediately before or soon after operation, or when employed in fresh operative fields.

Schmitz, reporting 163 consecutive cases (Jour. A.M.A., August 20, 1921) says: "Radiation treatment always causes a decided radiation sickness. During this period the patient could not be safely subjected to the additional trauma of a capital surgical procedure. The operation must be postponed for from three to six weeks, during which time the patient will have recovered from the radiation toxemia. If the operation is performed within a few days after radiation the patient succumbs to sepsis and shock with an alarming frequency. Should the operation be postponed to a later period the same danger is still present on account of necrosis of tissue in the cervical canal, which cannot be avoided. These factors and the intense connective tissue formation in the parametrium, which renders hemostasis difficult, therefore do not let it appear advisable to resort to preoperative radiation."

W. P. Graves (Surg., Gynec. and Obst., June, 1921) speaking from his own experience, states: "It may be said that we have not—so far as we know—cured with radium a single case of inoperable cancer of the cervix." And further, in view of his unfavorable experience with radium, and his favorable operative results, of which he gives statistics, he does not feel justified in substituting radium for radical surgery in cases favorable for operation.

John G. Clark (Annals of Surgery, June, 1920) after five years' experience with radium, states that he considers it an adjunct to surgery and that in the certainly operable cases they still advocate a radical operation followed by postoperative radiation. As yet they claim no cures from radium.

Since a permanent cure for uterine cancer by radium has not yet been proved, it seems to me that Dr. Skeel must find himself in the same position that Victor Hugo once found himself when he said, "I stand for a thing which does not exist!" If, however, radium has no other use, as one of our number declared to me this morning, it is an excellent refuge for a coward.

DR. CRILE (closing).—I have nothing to say in behalf of my paper, but I wish to express my great appreciation of the brilliant presentations of my two good friends, Dr. Skeel and Dr. Brown. I am sure before this question is finally settled you will hear many other papers on the same subject.

TERATOMATA OF THE OVARY

By Miles F. Porter, M.D., F.A.C.S., Fort Wayne, Ind.

THE word teratoma comes from *teras* meaning monster and *oma*, a termination meaning tumor. Some of the other names applied to tumors of this class are dermoid, teratoid, embryoid, morular. The term dermoid means "like skin" and, therefore, strictly speaking should be used to define only those tumors formed by skin inclusions and composed only of epiblastic tissue. As a matter of fact no tumor composed solely of epiblastic tissue has ever been described. Generally speaking, the word dermoid has been used to signify a rather large class of cystic ovarian tumors composed of the three embryonal layers which are rarely malignant. Bland-Sutton, Hertzler, and others, use the word teratoma to indicate a solid tumor made up of the same structures as the dermoids but composed of a larger proportion of embryonal cells and, for this reason, peculiarly prone to malignancy. Hurdon says "teratomata are solid embryomata and are malignant." The majority of authorities, I think, today accept the classification of Eden and Lockyear who divide teratomata of the ovary into two classes—cystic (usually called dermoids) and solid. This classification is also that suggested by Adami, Nicholls, and Ewing.

Concerning the origin of these tumors, Waldeyer and Wilms hold that they are ovigenic; Conheim, that they arise from early ectodermal inclusions. Krömer is satisfied that these tumors are of ovarian origin, the cystic element coming from the follicle and the tissue elements from the ovule. Douglas, on the other hand, says the whole question is hypothetical. We may take either of the positions indicated and be sure of being in good company. Certain it is that there are two forms of teratoma of the ovary; the one cystic, quite common and little prone to malignancy and commonly reported as dermoids; the other is rare, solid and frequently malignant.

It is well here to emphasize the fact that so-called dermoids of the ovary are much more frequently malignant than was formerly supposed to be the case. Ewing puts the rate of malignancy at 3 per cent. Hoehne says malignancy is more frequent in bilateral dermoids. The moot question, as to whether these tumors are congenital or postnatal in origin, is not, perhaps, of great practical importance. The writer has met with no case of malignant cystic teratoma in an experience covering a hundred cases, or more; while he has had one sarcomatous teratoma of the solid variety in an experience covering less than a score of cases.

This specimen was removed from an 18 year old virgin; it was entirely solid, the size of an adult head, pedunculated, without adhesions, encapsulated, symptomless, save from its presence, and sprang from the right ovary. The operation was done thirty years ago and the specimen examined by Drs. McCaskey, McCullough, and myself. At first it was regarded as a fibroma, but upon further investigation the diagnosis of sarcoma was made and later confirmed in a foreign laboratory.

It is of interest to note that the patient, now the mother of a family, is still living and, at last account, in good health. The presence of granulation tissue containing foreign body cells in the cyst wall is evidence of the irritating nature of the semisolid contents of the cysts often found in these tumors.

The frequency of occurrence of teratomata is placed all the way from 4 per cent (Olshausen) to 18 per cent (Martin) of ovarian tumors. It is beyond doubt true that many of these tumors have been, especially in the past, placed in the category of ordinary cysts of the ovary for the reason that frequently they partake largely of the character of simple cysts and careful examination is necessary to reveal their true nature.

Concerning the composition and structure of these tumors, it may be briefly stated that it varies much, from nails to eyelashes, including glands, organs of special sense, genital organs, nerve centers and nerves. The identification of rudimentary organs in these tumors, usually requires microscopic examination.

Teratomata, like adenomata, of the ovary are apt to affect both ovaries at once. If one bears this point in mind when a patient presents herself to the surgeon with double ovarian tumor, he will at once suspect the trouble to be either adenoma or teratoma. Teratoma frequently so distort the ovaries, that the true ovarian tissues may be unrecognizable to the naked eye; and yet, these organs be able to perform their full functions.

Usually, these tumors are of slow growth; but they may grow very rapidly. Sutton reports a case of a seventeen-year-old girl in whom a cyst, containing 78 liters of fluid, formed within three years. Unusual rapidity of growth suggests malignancy. Teratoma of the ovary may appear at any age, often in childhood, but most frequently between the ages of 30 and 40. The symptoms do not differ from those due to other forms of ovarian tumors.

Concerning the accidents likely to occur to teratomata, it may be said that they are more prone to torsion of the pedicle, because of their irregularity, asymmetry and size, smaller than ordinary cysts on the average, less liable to rupture because of their thicker walls, and more liable to malignant change because of the variety of tissue

cells they contain and because of the irritating nature of the cyst contents.

It is held by some that teratomata are peculiarly offensive to the uterus. Their presence is apt to cause abortion and both before and after delivery there is said to be great danger of infection. Personally, I have seen no cases of abortion due to these tumors and but one probable case of twisted pedicle. The patient whose case is herewith reported gave birth to a dead child and suffered a mild infection in which the tumors may be fairly said to have played a contributory part. The "probable" case of twisted pedicle was from a girl ten years old upon whom I operated for a supposed appendicitis and found instead, a right ovarian cyst, the size of a small orange, with a twisted pedicle. The diagnosis of teratomata was based on the irregular contour and consistency of the cyst, its size, and the age of the patient. There was no minute examination made to determine its exact nature.

CASE REPORT.—Mrs. J. W. W., housewife, age thirty-five, married three years. Family history unimportant. Had never been seriously ill prior to present trouble. Menstrual history normal. She had noticed that her abdomen was large as long ago as ten years, but thought it was "natural." On May 5th she gave birth to a child which the attending physician stated had evidently been dead for some days. Before the birth the doctor diagnosed a right sided ovarian tumor of large dimensions. Both patient and the doctor thought that she had gone over her time about twenty days. After the labor there was a low grade fever, and she had vomited prior to coming to the hospital, so that the doctor suspected bowel obstruction.

On May 10, 5 days after labor, she was brought to the hospital. I found a rather tall, well-nourished woman, with an abdomen as large as it should be at term, but rather fat and flabby. Fluctuation could be made out over the whole abdomen, except the epigastrium and left iliac region. The fluctuating area was dull. Aside from the abdominal findings, the examination was negative. No bimanual examination was made. I thought I detected the uterus, as large as a cocoanut, to the left. The patient was having some "gas pains," the bowels were loose, no appetite, lochia normal, temperature 100° F. Diagnosis right ovarian cyst.

Operation 10 days after arrival at hospital. Through a midline incision a large cyst was uncovered, tapped, delivered, the pedicle tied in sections, and removed. Examination of the left side revealed another cyst, the size of a cocoanut, of the left ovary. This also was removed and the abdomen closed, without drainage, although many lymph splotches were noted on the peritoneum; there was a little fluid in the peritoneal cavity and both cysts were universally adherent by wet-paper adhesions. The patient's recovery was tedious and slow with a low grade fever, some tendency to gas pains and abdominal tenderness, especially in the gall bladder region. It should be remarked here that the cyst on the right side was plastered to the under surface of the liver. There was no tympany. Blood culture revealed a paratyphoid infection.

The patient was finally allowed to go home although she showed an evening rise in temperature at times as high as 100°. It should be stated here that the wound healed by first intention throughout; but at the end of three weeks, there were a few drops of whitish pus from the upper end of the incision. The bulk of the right cyst was a clear fluid although there was a considerable quantity of the usual emulsion.

The fluid contents measured 9 quarts. The solid portion of the tumor consisted of teeth, hair, and skin. The left tumor was of the same general character as the right.

REMARKS

The operation was not done immediately on the patient's arrival at the hospital because she had not entirely recovered from a rather acute illness following her delivery, and because of the fear of an infection or other accident; and, it was also thought the tumor would interfere with involution. For these reasons it was thought wise to operate as above indicated. The outcome of the case to date is satisfactory. The question of a possible malignancy, however, leaves a fear in my mind that only time can either confirm or remove, for through carelessness the specimens were lost before a microscopic study of them had been made.

This case presents the following points which are of more than usual interest. The enormous size of the tumors without the patient's knowledge or suspicion that anything serious was wrong with her. Complete functioning of the ovaries, including pregnancy occurring in the presence of bilateral ovarian teratomata, child carried beyond term, born naturally but dead. The development of a paratyphoid infection during the puerperium. The time of operation for ovarian tumors during pregnancy and during the puerperium.

REFERENCES

Spalding: Am. Jour. Obst., 1919, lxxx, 401. *Hurdon, Kelly and Noble*: Gynecology and Abdominal Surgery, 1908, i, 198. *Adami and Nichols*: Principles of Pathology, 855. *Ewing*: Neoplastic Diseases, 1919, 593. *Douglas*: Surgical Diseases of the Abdomen, 1903, 780. *Bland-Sutton*: Tumors, Innocent and Malignant, 1908, ed. 4, p. 484. *Hertzler*: Treatise on Tumors, 1913, p. 623.

THE NEW TREND IN GYNECOLOGICAL THERAPY

By George Gellhorn, M.D., F.A.C.S., St. Louis, Mo.

It was the name of this organization that decided my choice of a subject. The very name suggests that close relationship of the sister sciences of gynecology and obstetrics from which, practically, all the progress of the last decades has sprung. This intimate kinship, this physiologic union of the two branches of medicine has repeatedly been assailed of late years and in several seats of learning it has actually been disrupted. In some of these instances, the sincere though mistaken idea may have prevailed that gynecology was nothing but a surgical specialty, while in others, personal and, therefore, all the more regrettable, motives seem to have been at work.

Be that as it may, it is a curious irony of fate that just at the moment when the general surgeons claim the gynecologic field as their own, gynecology has entered into a new phase of development where efforts are being made to replace surgical methods of treatment largely by nonsurgical means. It will be an easy and, I hope, an interesting matter to substantiate this statement by a brief survey of the situation.

Let us begin with cancer of the cervix—a surgical disease in the truest sense of the word. I will not again go over the ground that has been so well covered in today's discussions, nor will I present the statistics prepared for my own paper. These have been published elsewhere.[1] In a deadly disease like cancer every single case which is permanently cured is a decided gain and a triumph of our surgical endeavors; thus the operative cures of approximately 25 per cent might well be a source of satisfaction to us. But when we contrast this figure with the number of all patients afflicted with cancer, our achievements dwindle in importance.

For practical purposes the proposition amounts to this: Of 400 women who seek our aid for the relief of cancer of the cervix, barely 100 are actually and radically operated upon.[2] The other 300 are hopeless cases; their doom is sealed even though we may inflict some sort of superfluous surgery upon them. Of the 100, on whom the radical abdominal operation is performed, about one-fourth die of the operation, about one-half die from recurrences, and about one-fourth are alive and well after five years. A material change in this sum total is hardly to be expected because the technic of the operation seems to have reached the zenith of perfection.

And now comes radiotherapy as an earnest competitor of the surgical treatment in cervical cancer. To be sure, radiotherapy is

still on probation. The first five-year period of observation has passed only recently and the percentage of radium cures is still a point or two below that of the surgical cures. But if we look upon these statistics in their true light, they will assume a new significance. The radium results reflect, to a large extent, the infancy of the new method which is just about to emerge from the crude empiricism of its initial stages. Better results, therefore, are bound to come in the future. Even now, one authority[3] at least has already obtained results with radium that are in every way identical with those derived from surgery. Then, too, the cases treated with radium are on the whole more unfavorable than those subjected to operation. And to offset the slight difference in final results, there is a primary mortality from radium of 3 per cent as compared with the 20 or 25 per cent after operation.

If men of vast experience and superior technical skill, like Doederlein and Bumm,[4] eliminate surgery altogether in the treatment of uterine cancer and rely exclusively on radiotherapy, we should pause to think. As long as the subject is still a matter of discussion, the advocates of operation are, of course, justified in adhering to surgery; but the fact stands out in clear relief that surgery is no longer the only mode of attack and, unless all signs fail, the future of the treatment of uterine cancer belongs to radiotherapy,—at least until a biological method of treatment will have been discovered.

Personally, I had arrived at a formula which, until recently, seemed highly satisfactory to me.[1] Inoperable and borderline cases were treated exclusively by a combination of radium and x-rays. Early cases were operated upon by the radical abdominal method and received a preoperative treatment with radium and a postoperative treatment with x-rays. But I confess that my former confidence has deserted me, and at present my efforts are confined strictly to radiotherapy.

Another field of gynecology in which the therapy has, until recently, been exclusively surgical, is that of fibroids. As we look back upon the brilliant development of the operations for fibroids and consider the steadily decreasing mortality and the benefits reaped by our patients, we can well understand that the feeling became established in the profession that the question of the best treatment was definitely and satisfactorily settled.

The first reports on the effect of x-rays upon fibroids came as a complete surprise and met, in many quarters, with considerable incredulity; but extensive confirmation came in a very short time, and today it may be accepted as a fact that x-rays and radium check the hemorrhages in about 98 per cent and reduce the size of the tumors in from 70 to 80 per cent of the cases. Further improvement may be expected from a more careful selection of the cases, the use of more powerful

x-ray apparatus, and, perhaps, also from a judicious combination of radium and x-rays. At any rate, the surgical method of treatment, hitherto supreme, has now found a very strong rival in radiotherapy which can point to a mortality of 0 as against an average mortality of 3 to 5 per cent or even more, after surgical procedures.

Radiotherapy, however, cannot supplant surgery altogether. There are still enough cases of fibroids left in which an operation alone is indicated; but it is a significant fact that it is just the case with a poor surgical risk, the exsanguinated or the very fat woman, the patient with kidney or heart complications, that is particularly suited to, and benefited by, the new treatment. This is not the place to go into details as to indications and contraindications or a comparison of the complications following the two methods. The reader is referred to two previous publications.[5, 6] Suffice it to say that, approximately, only 30 per cent of the cases need operation while the overwhelming majority can be cured by nonsurgical means. Doederlein applied x-rays in 222 cases of fibroids and used the knife in 91 others in the same period of time. Kelly used radium in 210 cases and operated on 45.

The treatment of chronic inflammations in the pelvis, particularly those of gonorrheal origin, forms one of the most changing and interesting chapters of gynecologic therapy. We have all witnessed and participated in these changes. It did not take long to realize that the so-called conservative treatment, that is, rest in bed, douches, tampons, and the like, only served to hasten the transition from the subacute to the chronic stage, and that an operation was required to bring about a cure. The surgical treatment itself underwent a long and varied evolution within the memory of most of us. At first satisfied with removing only the affected tube, we soon learned that the apparently healthy tube of the other side quite regularly developed into a pyosalpinx and demanded a second operation. Then, the persistence of the inflammation in the interstitial portions of the tubes required deep excisions of the uterine horns. And yet, the patients continued to complain of symptoms that arose from the uterus and did not cease until that organ was eliminated. To reduce this dreary train of operations, Beuttner, of Switzerland, devised an operation which was sponsored by Polak, in this country, and revived by Bell, in England, and consisted of the removal of both adnexa and a part of the uterus. Other operators believed that an ascending gonorrhea in the female was, in a way, an incurable disease and, following the lead of Schauta and Landau, extirpated the entire uterus with both adnexa. Whatever method was adopted, it ultimately mutilated and unsexed the patient; and, as the disease occurs only in the reproductive age and is found more often in persons young in years, even the most successful outcome of our opera-

tions could not possibly fill us with wholehearted satisfaction. It was just this state of mind that induced many of us to attempt more conserving operations, such as injecting the tubes with some antiseptic fluid, splitting and draining them, etc., but you all know that these measures ended in signal failures.

More recently, however, a determined effort is being made to attack gonorrhea of the internal genitals by nonoperative means. Two novel methods have thus far been proposed. The first of these originated with Van de Velde,[7] of Holland, who started from the familiar observation that the approaching menstruation exerts an untoward influence upon an acute salpingo-oophoritis. The inflammatory process, which above all else requires rest and protection, is stirred up by the cyclic changes in the ovaries and the resulting phenomena in the pelvic organs. In these cases, Van de Velde applied radium and x-rays alone or combined and claims to have produced a "temporary" castration. The ovarian function was suppressed for from several months to one and one-half years; there was no exacerbation of the inflammation but fever and other symptoms subsided, and complete cure could be brought about by a simple absorbent therapy. Similarly good results were obtained in cases of chronic recurrent adnexal inflammation.

The second method is the adoption of foreign protein therapy in gynecology of which the vaccine therapy was an early though inefficient forerunner. By the introduction of foreign proteins, the protoplasm of the cells is stimulated to greater activity and the afflicted organs are, thereby, enabled to restore themselves to normal conditions. This, at least, is the theoretical explanation of the astounding results observed after the intramuscular or intravenous injections of milk or casein. A very recent article by Zill[8] includes a report of 90 cases of large adnexal tumors treated in this manner for several weeks. Of these 90 cases, 59 were cured completely, that is, the palpatory findings were perfectly normal; 27 were improved, in that there was still a slight thickening of the adnexa, but the subjective well being of the patients was unimpaired; and only in four instances there was no improvement.

A very similar rationale underlies the treatment of ascending gonorrhea by means of injections of turpentine. This substance deposited in the subfascial tissues, produces a reaction which sets free homologous proteins, and these, in turn, are apt to activate the protoplasm of the cells of the inflamed structures. A diminution, and even disappearance, of the adnexal tumors has been claimed in a large percentage of the cases thus treated.[9, 10] It is not surprising that a number of authors[11] have failed to observe such satisfactory results, for all these efforts of treating an ascending gonorrhea are still in an experimental stage; but they are highly promising and indicative of the present nonoperative trend in gynecologic therapy. Their final success would

confer a blessing upon our patients whom we can *cure* by operation only at the expense of their genital function.

The abuse of the curette has been a much discussed evil, and the attempts at restricting this favorite instrument to its legitimate use in abortion, polyps, and, for diagnostic purposes, in cancer, have been numerous. We have now advanced far enough into a better appreciation of the pathologic physiology of the female genital organs to know that dysmenorrhea and sterility very rarely require curettage. The profuse hemorrhages of adolescence, once the indication for repeated curettages, are now explained by endocrine disturbances and treated accordingly. As we learn to recognize a syphilitic metrorrhagia, we shall have no need for surgical treatment in cases of this kind. Uterine discharges of any kind used to call, automatically as it were, for the curette while today this instrument would be the very last thing an up-to-date gynecologist would consider in the treatment of this most common of all symptoms.

Another illustration. About a year ago I demonstrated before the St. Louis Medical Society the amazing effect of radium upon condylomata acuminata, and since then two papers have appeared reporting the same results with x-rays.[12] All along the line then, we see, today, a tendency to replace surgical means by nonoperative means in the treatment of gynecologic affections.

But the factor that promises to do more than any other towards reducing the need for surgical intervention, is the product, the very child of that much maligned and wantonly disturbed union of obstetrics and gynecology—*preventive obstetrics.* It mattered little to the midwife of whatever sex, whether or not the cervix was torn in delivery as long as the bleeding was not excessive. It was the gynecologist with obstetric training and obstetric practice who realized the relations of cervical lacerations to subinvolution and its sequels, and their possible bearing upon cancer, and who insisted upon the necessary care in applying forceps. Neither did the midwife pay much attention to the position of the uterus four or six weeks after confinement; and again, it was the gynecologist who recognized that more than 75 per cent of all displacements occur after labor, and that these may be prevented by the proper hygiene of the puerperium or cured by the temporary use of pessaries.

I trust that nothing that has been said in these pages, will be misinterpreted as a disparagement of surgery, its brilliant progress, or its marvelous results. Any such thought would ill befit one who himself is a gynecologic surgeon. But I take it that our ultimate object is the *cure* of the patient; not the *specific method* by which we arrive at our goal, and it seems to me that, as far as our present attitude goes, this ultimate object is attainable in a large percentage of the cases by nonoperative means.

It is, therefore, not illogical to suggest, at this time, a revision of our previous therapeutic conceptions and to point to the necessity of a recasting of our fundamentals of treatment. It may, then, be seen that gynecology is, after all, not an exclusively surgical specialty, that with all the tremendous importance and value of surgical treatment, it is neither the only nor even the most important means at our disposal.

When a business house takes over another business concern, an inventory is made prior to the transfer. You may say that such stock should have been taken *before* gynecology was bound over to surgery. Precisely; but since the transaction seems to have taken place without such a procedure, it might be well to provide an inventory *post festum*, so as to have it on hand in the future if a readjustment should be under discussion. It may be that gynecology will revert from the security of present nonoperative gains to former surgical methods; but this is highly improbable because the present status of affairs indicates, to my mind, a *higher* phase of development. It may also be that gynecology in its present form and with a growing leaning towards nonoperative lines, will not appear as attractive to surgery as it has seemed in the past, so that the realignment of gynecology and obstetrics will meet with less opposition.

BIBLIOGRAPHY

(1) *Gellhorn:* Jour. of Radiology, 1921, ii, 23. (2) *Taylor:* Tr. Am. Gynec. Soc., 1912, xxxvii, 314. (3) *Kehrer:* Tr. German Gynec. Soc., 1920. (4) *Doederlein and Kroenig:* Operative Gynäkologie, ed. 4, 1921, p. 574. (5) *Gellhorn:* AM. JOUR. OF OBST. AND GYNEC., 1921, i, 767. (6) *Gellhorn:* Jour. Missouri State Med. Assn., 1921, xviii, 220. (7) *Van de Velde:* Zentralbl. f. Gynäk., 1920, xliv, 994. (8) *Zill:* München. med. Wchnschr, 1921, lxviii, 803. (9) *Friedrich:* Zentralbl. f. Gynäk., 1921, xlv, 353. (10) *Sonnenfeld:* ibid., 686. (11) *Kronenberg:* ibid., 257. (12) *Stein:* Wien. klin. Wchnschr., 1921, xxxiv, 315.

DISCUSSION

DR. JOHN O. POLAK, BROOKLYN, NEW YORK.—Personally, I am of the belief that the subjects of obstetrics and gynecology should be combined. My reasons for that are, first, a large amount of our gynecology is the result of our obstetrics. Were it not for the lacerations of the cervix and the incidence of infection, we would not have cervicitis and parametritis. Were it not for the trauma to the anterior vaginal wall by prolonged labor, or administered in the course of delivery, prolapses and displacements would not occur.

Dr. Gellhorn has called attention to the value of radium in myomata of the uterus. I cannot let that pass without a word of warning, namely the danger from using radium in myomata where there is parametrial inflammation, as radium apparently, notwithstanding the observations recently made in Holland, particularly where there is streptococcic infection or the results of streptococcic infection, has the property of lighting up that infection.

His remarks concerning gonorrhea I do not think can be too enthusiastically endorsed. Personally, I feel that all the operations we have done have lost to these women the privilege of ovulation and menstruation. We feel that ovulation without menstruation is very unsatisfactory, that ovulation without menstruation is not cured by all the surgical means we have at hand. Consequently, I have adopted much the same method the doctor has suggested, particularly in gonorrhea, namely

to let these women alone and insist on rest at the menstruation period. I shall put into effect his other suggestion as soon as I can try it out. I do know that many patients with definite gonorrheal salpingitis have, eventually, become pregnant and borne children, while the women I have operated never have.

DR. STEPHEN E. TRACY, PHILADELPHIA, PENN.—It is evident that the treatment of carcinoma of the cervix uteri is still under consideration. It is undoubtedly true that in a certain type of simple, uncomplicated fibromyomas radiotherapy will give satisfactory results, but we must not overlook the fact that 30 per cent of these patients, as they come to the surgeon, have either a degeneration in the tumor or a malignancy of the pelvic organs; an additional 40 per cent have closely associated abdominopelvic lesions. This leaves only 30 per cent of simple, uncomplicated cases. It is generally agreed that, in patients under the age of forty years, the treatment should be conservative surgery—myomectomy. In patients past the age of forty years, only 16 to 18 per cent have simple, uncomplicated tumors. By surgery we not only get rid of the tumor, but at the same time remove the associated pathological lesions, and cure the patient of all symptoms in from 96 to 98 per cent of the cases. Pfahler claims 75 per cent of cures by x-ray treatment. He treats only cases referred to him by gynecologists or surgeons, and, therefore, has simple, uncomplicated cases and I know his results are excellent. As only 18 per cent of cases are uncomplicated, he would cure only 13.5 per cent of the patients as the surgeon sees them. Kelly claims 45 per cent of cures by radium, which is even less favorable than Pfahler's results. The question of what cases should be treated by radiotherapy depends on the diagnosis, and no one can determine with any degree of certainty whether he is dealing with a simple or complicated case.

The radiotherapists say but little about complications. Kelly acknowledges that 8 per cent of his cases subsequently require surgical treatment. Ward reported a case treated by radium in which a loop of bowel adherent to the uterus became necrotic, resulting in a peritonitis and death. The difficulty in diagnosis explains the complications of the radiotherapists. I trust Dr. Gellhorn will tell us, in closing, of his complications.

I endorse what Dr. Polak said about conservative treatment of inflammatory disease of the appendages. Some of these cases will recover and later on bear children; while those subjected to operation seldom do.

DR. HUGO O. PANTZER, INDIANAPOLIS, INDIANA.—Dr. Gellhorn in his clear, eloquent, and rather convincing paper has mentioned that radium is still on probation. I wish to cite a case, recently deceased, of inoperable cancer which had been treated with radium. The patient, cured of the cancer, died within one year with occlusion of both ureters as a result of the fibrosis brought on by the radium. Control, i.e., safe limitation of the radium effect, must be yet achieved.

Regarding the use of radium or x-ray in fibroid tumors of the uterus, we should individualize carefully before applying the remedy which entails sterility. I will cite a given case. Miss H., forty-three years old, came to me suffering from protracted and excessive menstrual flow due to multiple fibroids of the uterus, owing to which the organ extended to the umbilicus, and an associated toxemia, due to chronic suppurative tonsillitis and intestinal (ileocecal torsion) stasis. A swarthy skin and spare body, she looked pitiably "minus." To associate with her the hope of future marriage and motherhood was audacious, indeed! But here was a phase of her history, which induced me to make effort to effect a *restitutio ad integrum*. She was the oldest of seven children, when her father, a wage-earner, had died and had left his family practically destitute. With fine spirit she jumped into the arena; during the day she worked away from home and at night assisted her

mother in the manifold duties of caring for her six brothers and sisters. This she had kept up through the long years, uncomplainingly, zealously, and happily, but at the cost of her own health and prospects of life. After due attention was given to her general and throat condition, I surgically removed eight fibroid tumors from her uterus, taking pains to carefully resuture; and, also, cut extensive ileocecal membranes, which were distorting and unfitting for function these anatomical parts. It will suffice to say here, she made a fine recovery, put on the color and spirit of youth again; and, in turn, attracted a fine discriminating man who made her his wife. The culmination of it all: they have a fine boy, two years old now, born unaided *per via naturalis*, and the three constitute a volume of happiness, which, were it to fall out would make this world of ours perceptibly less happy.

DR. GORDON K. DICKINSON, JERSEY CITY, N. J.—I am sure the time is coming when surgeons will rely, more and more, on rest and depend more on physiological means. One of the most distressing things is the operating that is being done, not by true surgeons, but by operators, not men who are going around from school to school to see what they can see and how poor their work may be. For us to stand up for physiological methods and for time in the treatment of cases speaks well.

DR. FRED J. TAUSSIG, ST. LOUIS, MISSOURI, (by invitation).—I think that one of the good features that will come as the result of the nonoperative trend in gynecology is that women will not hesitate so long before they come to the gynecologist. In the past, how often have we all heard, "Yes, Doctor, I did not come right away because I thought it would be a matter of operation if I was referred to a specialist, and so I put off coming." This fear that nothing but operation will be suggested has deterred many people from coming. Particularly in the case of fibroids I believe we have in radium a treatment for the early stages which will lead to the prevention of these enormous tumors which have come to us in the past.

I do not think we can stress too much the importance of research study in our specialty. The moment you separate obstetrics from its sister branch gynecology you are going to cripple the amount of research study to a very great degree.

As to the indications for treatment, Dr. Gellhorn and I are almost in accord, particularly with regard to the use of radium. My personal feeling is still, however, that in early cervical cancer we should employ operative measures, in association with radium to be sure, but primarily an operative procedure. With the research and educational work that is going on each year, we are getting more and more of the early cases. I believe surgery still has an important place in cervical cancer.

DR. G. VAN AMBER BROWN, DETROIT, MICHIGAN.—The essayist has called attention to the desirability of getting temporarily rid of the menstrual flow in certain pathological conditions. On the other hand, it is often our aim and desire to preserve the menstrual function. I would like to call your attention to a case which brings out the advantage of using ligation and heat rather than radium. The case is one of a young woman, aged twenty eight, a nullipara with advanced carcinoma of the cervix. She was not willing to have her uterus removed, and refused to have anything done that would interfere with her menstrual flow; so we promised not to interfere with that. Had we resorted to radium we know we would have checked the menstrual flow for some months and, possibly, permanently. By doing the ligation and using the heat she made a mighty good immediate recovery with, apparently, a cure. The operation was performed a year ago last August, she has remained perfectly well, has gained twenty pounds in weight, and has not missed a single menstrual period, three days out of every twenty-eight, which is natural to her.

DR. CHARLES E. RUTH, DES MOINES, IOWA.—I had become so thoroughly satisfied with my results in hysterectomy, that I had no hesitancy in recommending any case of fibroid of sufficient size and producing symptoms, to operation. In one case, six years ago, in which a fibroid of large size was becoming a serious matter, I recommended operation which was promptly and emphatically declined. I then turned the patient over, with what advice I felt competent to give, to our roentgenologist who gave her two treatments of heavy cross-fire x-rays, with the result that a careful examination after four years showed the patient practically well with only the slightest vestige of fibroid still recognizable.

The next case of striking possibilities along the same line, came a few months later. This was a patient with a fibroid and the symptom of bleeding had existed for a sufficient length of time and was of sufficient severity to have practically exsanguinated the patient. Her hemoglobin was only 18 per cent. I did not feel justified in attempting a hysterectomy. She was twice transfused in the interim between menstrual periods, and then received x-ray treatment in the same manner as the other case in the hope that we could get a stay of execution sufficient to permit of a hysterectomy with greater safety. This patient also received two treatments and now, after two years, she has had no hysterectomy and is well.

DR. ROLAND E. SKEEL, LOS ANGELES, CAL.—I desire to offer a word of appreciation. On my way here I stopped at Salt Lake City to read a paper on the limitations imposed upon gynecologic surgery by our present day knowledge of radium therapy. In this I called attention to the fact, that so far as we know definitely at present, there are three gynecological disorders in which we should stay our hands in operating; first, carcinoma of the cervix; second, small fibromata without complications but causing hemorrhage, and third, that condition variously known as hemorrhagic endometritis, fibrosis uteri, and subinvolution, all of course with bleeding as the predominant symptom. I shall be glad to be convinced that there is some way of handling gonorrheal salpingitis, other than by surgery, if that method does not stop ovulation.

By surgical methods one waits until the infection has ceased, then amputates the tubes, and does not remove the ovaries. The recurrent infections, which occur because ovulation and menstruation continue, are, in my opinion, due to persistent cervical infection and, if a high cervix amputation is performed at the same time, I believe we can allow menstruation and ovulation to continue without difficulty. I am afraid of radium in the presence of infection, but I sincerely hope Dr Gellhorn is right, for the further away from surgery we get in cases that can be treated otherwise, the further we remove ourselves from the men who operate indiscriminately.

DR. MILES F. PORTER, FORT WAYNE, INDIANA.—My impression is that real surgeons stopped years ago operating for gonorrheal or any other kind of salpingitis. Real surgeons have not been operating for gonorrheal salpingitis for years and it is wrong to condemn surgery for operations that real surgeons have not, in my estimation, been doing. To operate for gonorrheal salpingitis and to operate for the results of it are two different things entirely, and, if we want to get at the correct solution of this question, we have to stop and figure out exactly where "we are at" and what we mean.

I do not think it is correct to say that one out of every four cases, operated for cancer of the cervix, dies. That is not correct. We will never get anywhere, and stay there, unless we start from a correct premise. One out of every four cases operated for carcinoma of the uterus does not die in the hands of men whose work we look up to. On the other hand, there are multiplied thousands of women throughout the United States, who are bearing children today, who have been operated

by good men for the results of gonorrheal salpingitis; and there are other thousands who have been operated for fibroids and are now bearing children.

DR. GELLHORN (closing the discussion).—Dr. Tracy will find the desired information in two previous publications which are referred to in my manuscript. In answer to Dr. Porter's question. I have quoted from H. C. Taylor, of New York. This author has computed a mortality of 25 per cent after the radical operation, and this method is the only one under discussion.

May I interpret your silence as your assent to my first point that gynecology and obstetrics should never and nowhere have been divorced, and that, after the mismating of gynecology and surgery has been annulled, the divorced parties should be remarried?

My second point was the growth of nonoperative tendencies in gynecology. After a man has worked a lifetime along surgical lines, it seems hard to have to abandon the altar one has helped to erect and to worship new gods. But it is always thus that the better has to give way to the best, and time will show whether or not the claims of the nonoperative methods are of enduring value.

THE HYPERTROPHIC-ULCERATIVE FORM OF CHRONIC VULVITIS. (ELEPHANTIASIS, ESTHIOMENE, SYPHILOMA)

By Fred. J. Taussig, M.D., F.A.C.S., St. Louis, Mo.

A FREQUENT source of confusion in medical literature lies in the attempt to call by one name conditions that are really manifold in their etiology and clinical appearance. A good illustration of this is to be found in the peculiar chronic infectious enlargement of the vulva to which the terms elephantiasis, pseudoelephantiasis, esthiomene, rodent ulcer, lupus, granuloma, and syphiloma of the vulva, have been applied. Perhaps the term that is most nearly justified is that suggested by Stein, "syphiloma," for syphilis is doubtless the most frequent etiologic factor in the formation of these hypertrophic ulcerating growths. Granuloma fails to express the hypertrophic character of many of these cases. Lupus is identified with tuberculosis, which is only rarely present. Esthiomene and *rodent ulcer* would apply more to the ulcerating cases and elephantiasis, though most generally adopted, has the least to recommend it, because of the confusion with filarial lymph stasis and the absence of any consideration of the chronic infectious character of the condition.

I would prefer to get along, as far as possible, without any hard and fast term but rather to group this condition as the *hypertrophic ulcerative form of chronic vulvitis.* Under this general head, the cases due to syphilis, to tuberculosis, to the "climatobacterium granulomatis," to filariasis, and to other sources of infection can be separately considered. Any attempt, however, to individualize these cases will meet with difficulties, for symptomatically, anatomically and even histologically, they are often so much alike that their etiology cannot be determined.

As I see it, we should not be concerned so much with the particular microorganism, that may be present in any one case, as with the special anatomic, physiologic, racial, and social factors that lead to the production of this characteristic lesion. Beside the infecting agent or agents there are, I believe, five factors that can be held responsible: (1) A racial predisposition to fibrous hypertrophy. (2) The manner of lymphatic distribution in the vulva. (3) The looseness of the vulvar skin predisposing to edema. (4) Lack of cleanliness from secretions and excretions in this region. (5) Repeated excoriations from coitus with resulting chronic wound infection.

(1) When we consider that the negro makes up but one-tenth of the population of this country, it is striking that, practically, all these

cases of vulvar hypertrophy in American literature are found among colored women. Stein's two cases, Gallagher's four cases and the 13 cases considered in the present report were all negresses. In fact I can recall having seen but one such case in a white woman, a prostitute, in whom, moreover, an admixture of negro blood was suspected. Even the filarial form of elephantiasis of the vulva has been noted primarily in the colored races. In European literature the condition has been found almost exclusively among prostitutes. That this tendency to fibrous hypertrophies of the vulva among colored women has some relationship to the similar tendency to keloids and uterine fibroids in this race, seems more probable. There can be no question as to the

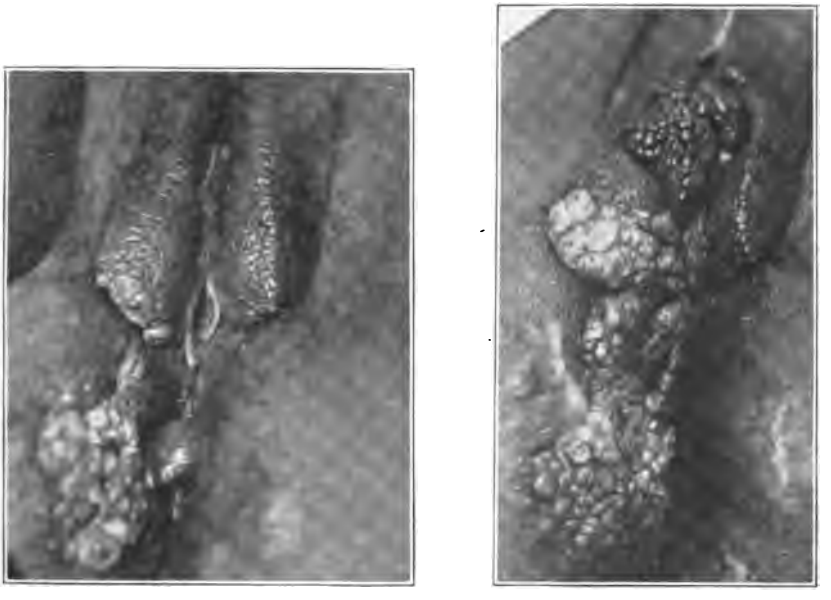

Fig. 1.—(Case 11) Combination of ulcerative and nodular form of chronic hypertrophic vulvitis. On the left side we see beginning hypertrophy with extensive ulceration. The right hand picture was taken 2½ years later and shows the continued ulceration with marked hypertrophy of clitoris and right labia.

pronounced racial predisposition to this condition existing among the negroes. I have seen neglected syphilitic ulcerations in white women, even prostitutes, produce only slight thickening or edema of the labia, while in the negress there usually developed a considerable pendulous tumor.

(2) The anatomic distribution of the lymph channels of the vulva predispose to lymph stasis. In filarial infections, the occurrence of a lymphatic enlargement in the inguinal and femoral region not only blocks the flow to the leg, but also to the labia on the same side, Koch has reported cases following removal of the inguinal glands. The two most pronounced hypertrophies in my series occurred in

women who had had a chronic infection of the inguinal and femoral lymph glands preceding the development of the mass in the inguinolabial fold on the same side. Lymph stasis of some degree, whether in the groin or in the vulvar tissue itself, must be considered as a *sine qua non* in the production of these enlargements.

(3) The looseness of the vulvar skin makes possible the formation of chronic edematous deposits with resulting fibrosis and enlargement of these parts. Together with the eyelids and the back of the hands, the vulva is one of the first points at which a tendency to edema will be manifested. The edema of pregnancy is often localized in the vulva.

(4) Uncleanliness is an important etiologic factor. In no instance is this disease found among women of the better classes. Persons with neglected syphilis and gross lesions about the external genitals may develop a slight thickening of the tissues; but, if they are clean about

Fig. 2.—(Case 13) The nodular type involving clitoris and left labium minus in a patient who had been confined two days previously. The tumor hung between the thighs and was very edematous. No ulceration whatsoever in this case.

their person, they do not develop these extreme hypertrophic ulcerations. Often a syphilitic rectovaginal fistula, together with a gonorrhea, makes it almost impossible to keep the parts clean. On the other hand, once the condition has developed, the best care and hospital nursing trying to keep the parts clean, will not materially influence the size of the mass or the extent of the ulcerations.

(5) The disease is found solely during the period of greatest sexual activity, and it is certain that the repeated traumatisms of coitus, especially in prostitutes, has much to do with the production of hypertrophy. The frequent occurrence of tertiary syphilitic ulceration about the vesibular ring results in repeated injuries with resulting wound

infection following coitus. The poor nutrition of these parts produced by the lymph stasis and obliterating endarteritis make wound healing slow; so that, in most instances, these ulcers do not heal entirely and must be excised.

As to the nature of the infecting agent in this disease there is, as has already been stated, much difference of opinion. Syphilis is found in 80 to 90 per cent of the patients; but there is some difference of opinion as to whether the lesion is to be classified as a tertiary gummatous deposit or as a postsyphilitic process. Many of these cases have a negative Wassermann with positive evidence of a previous syphilis. One or two of my cases, that have been under observation a long time, had a positive Wassermann in the first year of ulceration and then, later, when the hypertrophy became more pronounced, developed a negative Wassermann. Even after therapeutic excitation, the test remained negative. Such cases were, usually, totally uninfluenced by treatment; so that I feel we cannot properly class them as syphilitic lesions, but rather as chronic ulcerations on the basis of syphilitic scar tissue.

While textbooks on gynecology have, in the past emphasized filariasis as a factor, it is apparently rather rare, not nearly as frequent as the filarial elephantiasis of the scrotum in men and limited to certain tropical areas. In only a small portion of those in whom the diagnosis of filarial elephantiasis vulvae is made are the filaria actually found circulating in the blood. Some believe it to be purely a postfilarial condition.

Dermatologists have made special studies of a form of vulvar hypertrophy found in Porto Rico, British Guiana, and tropical regions, in which the development of ulcers is more pronounced than in filarial infections. They have found a peculiar germ called the "climatobacterium granulomatis" in all of these lesions. Most authors feel certain that this disease is not syphilis. The slow advance, superficial character, and the vascularity of the lesions, tend to differentiate it from gumma. Goodman's recent reports in the Archives of Dermatology emphasize the contagious character of these lesions and its occurrence, primarily, in prostitutes.

Tuberculosis of the vulva has been found in some few cases associated with these hypertrophic tumors and, in one of my series, the absence of any syphilis, the presence of giant cells in the ulceration, and the positive signs of an active tubercular lesion in the chest, make the suspicion of a tubercular factor in the production of the lesion very strong.

Gonorrhea is, probably, never a primary factor, but will often greatly increase vulvar irritation and so, secondarily, aids in the growth of the vulvar enlargements. In the presence of a profuse

leucorrhea the tendency to the papillonodular form of hypertrophy is more pronounced.

In two instances of my series tissue was removed and specially stained for Ducrey's chancroid bacillus, but with negative results. A suppurating bubo will, however, predispose to lymph blocking and so, in the presence of syphilis, may lead to more pronounced enlargements.

In general we may distinguish three types of cases according to location: (1) An inguinal-labial type involving, usually, only one side, and leaving the clitoris unaffected. (2) A clitoral type involving

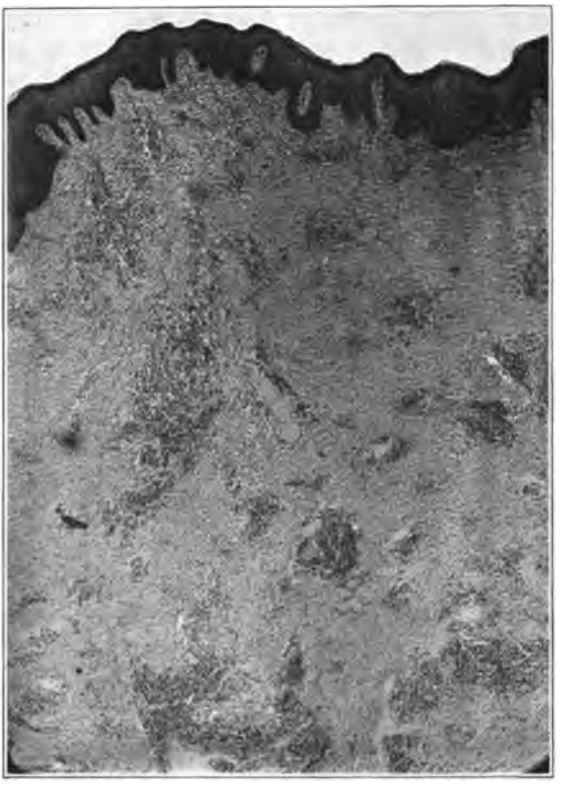

Fig. 3.—(Case 6) Microscopic section of nodular mass removed by operation. Everywhere are areas of lymphocytic infiltration. The epithelium shows increased keratin but less papillary extensions with the connective tissue than ordinarily is formed. No superficial ulcers present at time of operation.

the clitoris and, usually, also both labia minora; but not the labia majora. (3) A diffuse type in which the hypertrophy is more general, involving the entire vulva more or less.

A further grouping of these cases is also possible according to the prevailing type of pathologic lesion. We can have: (1) A *hypertrophic* form, in which large pendulous tumors are found, usually with but slight ulcerations. (2) An *ulcerative* form, in which the ulcerating granuloma makes up the bulk of the enlargement. (3) A *papillary*

form, in which the tumor surface is covered with small nodular or papillary excrescences. Often there is a combination of two or more of these forms.

Symptoms are usually insignificant in this disease. This may, in part, be due to the low state of intelligence and lowered pain sense in these individuals. Some discomfort from the weight of the pendulous mass, interference with walking, and urinary and rectal irritability may be noted. If the mass becomes more acutely inflamed, for some cause or other, there may be pain. Dyspareunia is often the

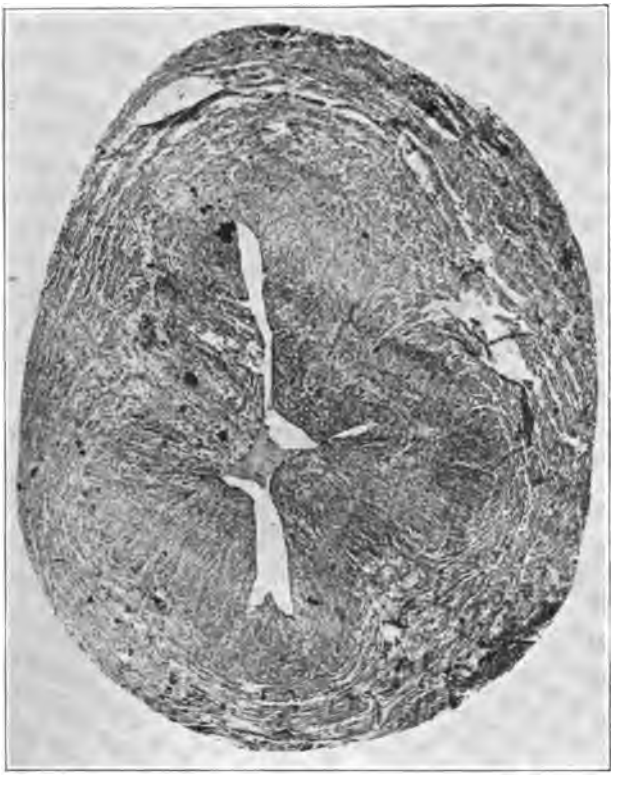

Fig. 4.—(Case 6). Cross section of blood vessel formed in tumor mass showing obliterative endarteritis.

main reason for their seeking medical advice. When we think of the severe pain some women experience from small burns or chancroidal sores about the vestibulum, it is amazing that these extensive ulcerations produce so little discomfort. Very meagre, and often contradictory statements as to the duration and course of the disease, are given by these dull-witted individuals.

From a diagnostic standpoint this condition is of interest because of its confusion with carcinoma. In the latter, however, we have a circumscribed lesion that is brittle, bleeds easily, and is practically

never found in the negress before the menopause. The differentiation from fibroid tumors of the vulva is usually easy, since fibroids are circumscribed, have a smooth skin surface, and present no evidence of ulceration.

A word must be added regarding the treatment of these cases. Antisyphilitic treatment, even the most persistent and vigorous, will not cure these cases and will only rarely and temporarily affect the size of the tumor mass. It is well, however, that such treatment be employed to promote prompt healing after surgical intervention. The record in the seven cases that underwent operation in my series, shows the uniformly satisfactory results of vulvectomy in these cases, provided only, that the incision be wide enough to include all indurated and ulcerated tissue. It is better to make this incision with the cautery, though in some of the cases here recorded such a plan was

Fig. 5.—(Case 10). Inguinolabial type showing extensive ulceration as well as hypertrophy associated with suppurative adenitis.

not adopted. One case, that was followed for eight years after vulvectomy, remained perfectly well except for a rectal stricture that required further dilatation.

In conclusion I append a brief record of the 13 cases included in the present study. It will be noted that four of these patients were seen in the services of my colleagues, Drs. Gellhorn, Crossen and Otto Schwarz, and thanks are due for permission to include them in the present analysis of the question.

CASE REPORTS

CASE 1.—Ophelia T., twenty-seven years, colored, two children, one stillborn and one living, came to Washington University Hospital in 1907 complaining of partial incontinence of feces and the formation of a lump in the genital region that had grown to the size of a lemon during her last pregnancy one year previously. Examination showed a rectovaginal fistula, a stricture of the rectum, ulcerations about the fourchette and urethra, and a nodular enlargement occupying the region of the clitoris and both labia minora. Antiluetic treatment produced but slight improvement. Vulvectomy and repair of rectovaginal fistula, followed by further treat-

ment, gave good results. She was delivered of a full-term normal child in 1912. When seen last, in 1915, there was no recurrence of the vulvar condition, although the rectal stricture and gummatous deposits in the rectum still required treatment. Microscopically, the organs removed, showed typical sclerosis and chronic infection.

CASE 2.—Mattie L., twenty-five years, colored, never pregnant, entered St. Louis Skin and Cancer Hospital, May 14, 1910, with a swelling of the vulva that had persisted for one year associated with ulceration over the perineum. It had been diagnosed as rectal cancer. Examination showed rectum uninvolved. Both labia and clitoris enlarged to size of a man's fist. Urethra normal. Antiluetic treatment caused no change in the mass; hence, on May 31, 1910, excision of mass. A latent tuberculosis of the lungs was also diagnosed and, after the operation, a pleuritic exudate developed, but this was gradually absorbed. No tubercle bacilli found in the mass removed, but numerous giant and epithelioid cells were found. There was also marked proliferation of the papillae of the vulvar skin and infiltration with lymphocytes and plasma cells.

CASE 3.—Mamie F., thirty-one years, colored, entered Barnes Hospital Dec. 16, 1914, with old luetic scars over body, no pregnancies, history of rectal abscesses three years ago, and for the last year a vulvar enlargement. No bleeding or discharge. Mass occupying left labium majus eight inches long and four inches wide with small base. Ulceration over perineum. No mention of urethral or rectal lesion. Wassermann positive. The vulvar skin was thick, wrinkled and cracked. Very slight tenderness. Refused treatment.

CASE 4.—Mattie J., thirty-seven, colored, entered Barnard Skin and Cancer Hospital August 22, 1919, five pregnancies, two miscarriages, luetic eruption at 23 years. Bubo in left groin one year ago. Since then vulvar swelling. Examination shows entire vulva seat of ulcerations serpiginous with raised border. Left labia edematous and enlarged. Rectum negative. Wassermann negative. Ducrey's bacillus not found. Tissue removed for microscopic study showed only chronic granulation. Refused treatment.

CASE 5.—Nettie T., twenty-five, colored, no pregnancies, entered Barnes Hospital Jan. 13, 1919, with history of labial swelling for past three years. Treated for lues in skin clinic during 1917. Tumor became painful two weeks ago. Temp. 99., no leucocytes. Labia minora and clitoris forming a mass 10x5x4 cm. Ulcer beneath it. Vulvectomy, by Dr. O. Schwarz, with good final result.

CASE 6.—Johanna O., thirty-four, colored, entered Barnes Hospital January, 1920, gave history of pruritus and swelling in left labia, the size of an egg, four years previously. In two years it was the size of a grape-fruit, and for the past year had grown to the size of a man's head. Antiluetic treatment and amenorrhea for past year. Pain and discomfort on walking during month before entering hospital. Examination showed a suppurating sinus in left inguinal region above Poupart's ligament. An indurated mass, 20x18x8 cms. in size, involving groin and left labia. Right labia also somewhat enlarged. An ulcer the size of a half dollar on top of the mass. Large whitish scars from former ulcerations. Urethra not involved. Papillary projections over vulva and perineum. Vulvectomy Jan. 15, 1920, by Dr. H. S. Crossen. Wassermann negative before and after operation. Histologically it is noteworthy that the entire mass showed evidence of chronic inflammation, plasma cells, lymphocytes, and sclerosis of connective tissue in the absence of any active ulcerations.

CASE 7.—Nona M., thirty, colored, entered Barnard Skin and Cancer Hospital May 14, 1919, one child, ulcers and vulvar enlargement of moderate extent that began one year ago. Pain on defecation. Examination showed considerable gen-

eral hypertrophy with many rectal tags. Stricture of the rectum. Vigorous antiluetic treatment. Six salvarsans and many deep injections up to July 8, 1919, produced no visible improvement. Vulvectomy refused.

CASE 8.—Rose J., twenty-four, colored, entered Barnard Skin and Cancer Hospital October 11, 1917, one miscarriage. History of lues for previous year. Clitoris enlarged to size of a thumb with ulcer beneath it extending up to urethra. Attempt at autoinoculation from ulcer to test for chancroid gave a negative result. Wassermann negative. Returned two years later, Sept. 15, 1919, with condition only slightly worse. Antiluetic treatment produced no change. On Nov. 8, 1919, vulvectomy. Mass removed included both labia as well as clitoris, somewhat pendulous, hard, nodular, with many ulcerations. It was three inches long and one and three quarter inches in diameter.

CASE 9.—Bessie K., twenty-six, colored, entered Barnard Skin and Cancer Hospital Feb. 11, 1920, four pregnancies, no living children, had a vulvar lump and ulcer for two years. Pronounced leucorrhea. Some dribbling of urine. Wassermann positive. Both labia involved in a mass the size of a fist with numerous ulcerations. Antiluetic treatment produced very slight change. Refused operation.

CASE 10.—Irene J., thirty, colored, entered Barnard Skin and Cancer Hospital Dec. 22, 1919, two pregnancies, one miscarriage, gonorrhea at 21. Present trouble began one year ago with pimple in right groin that was opened with a needle, but mass rapidly grew larger until it hung between thighs and interferred with walking. Wassermann positive. Entire right half of vulva involved in a hard mass with areas of ulcerations extending up to the right groin. Preliminary antiluetic treatment; then, on Feb. 19, 1920, operative removal of mass by Dr. G. Gellhorn. This mass was 26x16x5½ cms. and weighed 620 grams. Good operative result. Referred to skin department for further antiluetic treatment.

CASE 11.—Dora W., forty-two, colored, came to Skin and Cancer Hospital May 24, 1919, no pregnancies, history of rectal abscesses for five years and for two years an ulcer and warty growths on vulva. Small rectovaginal fistula. Wassermann positive. Radium in form of plaque over site of perineal ulcer applied tentatively by Dr. G. Gellhorn. No improvement following. Intermittent antiluetic treatment. Returned two and one-half years later with considerable increase in vulvar swelling, especially in region of the clitoris as seen by the two photographs. (Fig. 1.) On Sept. 15, 1921, vulvectomy and excision of perirectal ulceration.

CASE 12.—Emma P., twenty-two, colored, entered City Hospital No. 2, August, 1921, no pregnancies, very dull witted, stated that she had noticed a hard swelling of her genitals for about one year with a sore in that region. Examination showed a pendulous mass consisting of labia minora and clitoris with ulcerations around the urethra the mass being about the size of two fists. Wassermann negative, but spirochæte found in dark-field of ulcer. Refused operation and left hospital without treatment.

CASE 13.—Lillie M., twenty-nine, colored, entered City Hospital No. 2, September 17, 1921, in labor. She was delivered by version by Dr. L. Dorsett. This was her fifth living child. She stated that the tumor mass, hanging from the vulva, had been present for 11 years. During each pregnancy the mass became much larger and after delivery again returned to its former size. She had been operated for rectal fistula and abscess. Examination eight hours after delivery showed a soft pendulous mass the size of a child's head springing from the left labium minus. (Fig. 2.) Scars from old ulcerations visible on the inner aspect. No active ulceration. Urethra normal. The mass showed marked nodular papillary surface. Within 24 hours the edema had decreased and the mass was visibly smaller.

DISCUSSION

DR. JAMES E. DAVIS. DETROIT, MICHIGAN.—I have had one case which belonged to the diffuse hypertrophic type and the labia and clitoris were involved. The patient was a colored woman and there was a very large number of clearly defined tubercles and giant cells throughout the entire growth.

DR. GORDON K. DICKINSON, JERSEY CITY, N. J.—I would like to ask what relation this lesion has to esthiomene.

DR. TAUSSIG, (closing).—Esthiomene is only another name for this lesion. I believe that the sooner we get a simple name for things the better it will be. This particular type of chronic vulvitis with hypertrophy should be grouped as a part of the chronic affections of the vulva. Of course, in hospital records I suppose it is difficult to avoid the use of special terms.

TRAUMATIC INFLAMMATION OF THE FUNDUS OF THE BLADDER

By Edgar A. Vander Veer, M.D., F.A.C.S., Albany, N. Y.

THE discoveries in the field of surgical research are becoming more and more circumscribed, and the finding of anything absolutely new is a difficult matter. Few great discoveries still remain to be made in the realm of surgical science and we must more and more content ourselves with the working out of the minor details which, while just as important as the big ones, still do not attract the notice that the seemingly larger things do. While the advances in medicine and surgery are made by picking up these various small observations and welding them into a harmonious whole, the patient workers who do this do not, as a rule, receive the credit and fame which goes to the more brilliant investigator who makes the more wonderful discovery. There is room for both in the field of surgery, but both should receive the proper recognition which is their due. One's experience as presented in our discussions is ever being added to in exactness of detail and results. Perhaps the best way to explain the title of my paper is to cite the history of the following case, which recently occurred in my service at the Albany Hospital. It has many unusual features, and it seems wise to place it on record.

Miss M. G., aged seventeen, student, referred by Dr. Parkhurst, entered the Albany Hospital January 5, 1920. The patient complained of pain and swelling in the pelvic region. Her past history was negative, with the exception of an injury received several months ago; she has had the usual diseases of childhood; menstruation was established at fifteen, and has been regular with no unpleasant complications. Present history: October, 1918, while attending college in Boston, in running upstairs, she fell and hurt the symphysis pubes. Apparently the fall occasioned no untoward symptoms at the time, and the accident passed out of her mind. Six months later, however, the patient noticed a small swelling in the region of the injury. She then noticed for the first time some irregularity in menstruation, excessive flowing at each period, and also a frequent desire to urinate. The urine was cloudy, yellow, alkaline; the specific gravity was 1018; there was a trace of albumin, but no sugar. Microscopically it showed pus and epithelial cells, cells, amorphous urates, and free phosphates.

Physical examination proved negative, save for the presence of a tumor, the size of an orange, located in the midline just above the pubes, and, apparently connected with the anterior abdominal wall. Bimanual examination revealed a mass of above mentioned proportion, apparently connected with the fundus of the uterus, but which proved to be the bladder. A tentative diagnosis of myoma uteri was made; operation was advised and accepted.

Operation, January 8, 1920, consisted of dilatation of the cervix and curettage of the uterus. A small amount of detritus was obtained, and the uterus found

slightly larger than normal. Then an incision in the midline was made three inches long, between the umbilicus and the symphysis pubes, and a tumor mass was found involving the muscular structures as well as the peritoneum. Further exploration showed the mass included the fundus of the bladder. Macroscopically the tumor had all the appearance of malignancy. The pathologist's report from a frozen section was that of chronic inflammation, with suspicion of carcinoma. Owing to the doubt in the case, removal of the mass, with resection of the fundus of the bladder, was deemed advisable. The fundus of the bladder was resected with the diseased tissue. The openings of the ureters were identified and not found involved. The wound was closed in the usual manner; a selfretaining catheter placed in the bladder, and one cigarette drain left in the abdomen. The patient made a slow but uneventful recovery and has remained in good condition since then. After operation she complained of pain in the region of the right kidney, which entirely disappeared at the end of six months.

Pathological report: Tissue from bladder; chronic inflammation in bladder wall with organized exudate of entire surface of specimen. Etiology not determinable. Wassermann, negative. After the specimen had been removed, and while examining it in the gross, a small spicula of bone was removed from its center, near the outer wall of the fundus of the bladder.

The interesting point in this case is to determine just what the etiologic factor was which caused the inflammation of the fundus. Evidently, in falling, the patient chipped off a small piece of bone from the inner side of the os pubes. This piece of bone, in turn, penetrated the outer wall of the fundus of the bladder, causing the inflammation which extended from the bladder to the anterior wall of the abdomen and the subsequent train of symptoms.

A careful search of the literature has been made, but I have been unable to find similar cases reported anywhere. Traumatisms of the bladder from some external force cause, as a rule, rupture of that organ, or else the injury is so slight as to heal without producing any symptoms.

Most traumatisms of the bladder are apt to be of a penetrating character, such as gun shot or stab wounds, or severe and extensive fractures of the pelvis. In the case reported, is it not possible that the piece of bone found, might have come from one of the ossifying points of the os pubes, because it is well known that this bone is one in which the centers of ossification become complete rather late, and that the age of the patient would lend probability to this thought?

In studying the case, several interesting points may be considered. Did I lay sufficient importance upon the possibilities that this enlargement was the result of the accident? Should I have stated, in performing the operation, that, in the beginning it was merely exploratory? The excessive menstruation and other symptoms led me to believe I was dealing with a fibroid. The age of the patient would weigh against the possibility of a fibroid, as these tumors are very rare in young women.

At the time of the operation, the detritus from the uterus was found

to contain simple chronic thickening of the endometrium; the depth of the uterus seemed about normal, which should have made me think of some other condition besides myoma uteri. I am frank to say that not enough emphasis was placed on the history of the previous accident. But the accident seemed so trifling that I did not give it the consideration it seemingly deserved. I also regret that a blood count was not made, as it would, undoubtedly, have shown an increased leucocytosis and thus indicate the presence of an inflammatory condition. Strange to say, there were no adhesions found in the abdominal cavity except a few between the fundus of the bladder and abdominal wall. The intestines presented no evidence of peritonitis.

Resection of the fundus of the bladder is a very serious matter and the criticism may well be made: Why was it done in this case when the condition was purely an inflammatory one? Owing to the doubt on the part of the pathologist, as to the exact pathological condition in the frozen specimen, I was convinced the safest and wisest course to pursue was to remove the mass. Conditions very frequently appear quite different at the operating table from what they do in the pathological laboratory.

DISCUSSION

DR. GORDON K. DICKINSON, JERSEY CITY, N. J.—The man on the fence plays the best game of ball, consequently, it is beyond me to criticize the doctor's paper; but in Sweden they have recognized a disease which we often see and pass over, and that is myositis. I believe we pay less attention to the muscle tissue than we should, particularly in many fractures. The bladder is a viscus, as are also the intestine and the stomach. I have more than once seen much damage done to the stomach, especially where through trauma we have a hemorrhage into the stomach tissue. It then becomes a point of least resistance and, not infrequently, within six months we find an ulcer attached to that spot, just under the point of traumatism in the abdomen. I should think that in this case there was a traumatism leading to interstitial hemorrhage and an attachment to the bladder, with the formation of an inflammatory tumor.

DR. MILES F. PORTER, FORT WAYNE, INDIANA.—It occurred to me while the doctor was reading that, probably, this girl did have a fracture as the result of the blow, that perhaps there was pulled off the pelvis a piece of bone by muscular contraction which would naturally take place when she fell.

ATRESIA AND STRICTURE OF THE VAGINA

By James E. King, M.D., F.A.C.S., Buffalo, N. Y.

ATRESIA and stricture of the vagina are problems that not infrequently confront the gynecologist. They lay claim to his attention not because they of themselves are a source of suffering, but because they prevent the woman so affected from fulfilling her mission as a wife and mother. There is a voluminous literature on various phases of the subject. Most writers have confined their discussion to congenital absence of the vagina and the operative procedure for rectifying it. A review of the literature seems also to indicate that certain of the acquired forms have been regarded and described as congenital.

Atresias of the vagina may be divided into the congenital and acquired forms. Of the congenital atresias, imperforate hymen is the most frequent type. Absence of the vagina, strictly speaking, is not an atresia, inasmuch as in such cases a vagina never existed, but for convenience it may be placed under this heading. Finally transverse septa may also be found as a congenital anomaly. These defects are rarely discovered until puberty, when presence of the menstrual molimen with absence of flow, prompts an examination.

Congenital absence of the vagina is a rare anomaly and it is almost invariably associated with either a very rudimentary uterus or its complete absence. Indeed, cases that show an apparent absence of the vagina but in which there is found a well developed cervix and uterus, should be studied carefully, as it is very probable that they belong to the acquired rather than to the congenital type. Congenital types present no etiologic problem and they are interesting mainly from the viewpoint of their surgical treatment. It is not the purpose of this paper to enter into the discussion of these forms.

The acquired types of atresia are much more interesting. It is convenient to classify them in three groups, based upon the time of life when they occur; namely, those cases that develop during infancy and childhood, those that develop during the childbearing period, and those that develop after the menopause. This classification finds justification not only by reason of the different clinical aspects presented by each of the three groups, but more especially because of the distinct etiology found to cause the atresia during each of these three periods. Considering the etiologic factors in the three groups of our classification, we find the atresias produced during infancy and childhood to be due to trauma and vaginal infections. During the reproductive

period they result from injuries and infections of labor, and very rarely to other vaginal infections, while after the menopause almost the sole cause is an atrophic vaginitis with a superimposed infection. Although the atresias produced during the childbearing period and after the menopause are interesting and worthy of discussion, only those atresias that develop during infancy and childhood will be discussed.

Atresias due to trauma during childhood present no question as to their etiology. The history of an injury, and the evidence of malformation and scar tissue about the vulva, clearly determine the causal factor. On the other hand, in the cases of atresia resulting from infantile vaginal infections, it is often impossible to obtain a history of the vaginal discharge and it may thus be difficult to establish the real cause of an atresia discovered in adult life.

Undoubtedly by far the most common cause of an atresia developing during childhood is infantile vaginitis. The bacterial cause of vaginitis in childhood is generally conceded. Grouped broadly, these infantile vaginal infections may be classified under two headings; those due to the gonococcus, and those due to other bacteria. With regard to the miscellaneous infections there seem to be many views, having but little foundation in scientific observation, that have found their way into many text books unquestioned. Most text books, for example, give first place to the exanthemata as a cause of vaginitis in children. The writer has never seen vaginitis associated with or following any of the exanthemata. Such cases he believes to be rare, and if they do occur, to be of short duration. However, children exhausted by any severe or long illness, or those suffering from malnutrition, are not infrequently subjects of vulvitis when cleanliness is not maintained. The possibility of a severe streptococcus ulcerative infection, or of a true diphtheritic infection of the vagina, is conceded. In such instances the great severity of the constitutional symptoms dominates the picture. A chronic purulent discharge in young children that bacteriologically shows no gonococci is not infrequently considered to be due primarily to a mixed infection. As a matter of fact, this mixed infection finds its origin in a gonorrhea and the persistence of the discharge is due to the pathology caused by, and remaining after the disappearance of, the gonococcus itself.

That the gonococcus causes a very large majority of vaginal discharges in children must be generally admitted. A committee representing the American Pediatric Society attempted by means of a questionnaire sent to hospitals and physicians, to obtain information on which might be based some definite data on this important subject. The result emphasized the fact that there existed among a considerable proportion of those approached, a failure to appreciate the real seri-

ousness and importance of gonorrhea in childhood, and it made it clear that there still remains much to be done in placing squarely before the general profession the real truth concerning vaginitis in children.

A discussion of the atresia due to gonorrhea in childhood necessarily comprehends a consideration of certain features of gonorrheal vaginitis. It is well established that gonorrhea of the vagina is a disease of infancy and early childhood. The stratified epithelium of the glandless membrane of the adult successfully resists attacks of the gonococcus, while the more delicate vaginal tube of the child offers a field easily infected by, and difficult to rid of, these germs. The epidemics in institutions are now well understood to be due to contact infections, through the media of a large variety of agents. A discussion of the various means by which the gonococcus may find entrance to the vagina of a child is not pertinent to this paper.

Of the clinical manifestations following infection it may be said that as in adults, they vary in different individuals. Certain cases present but a moderate discharge, that attracts little attention and soon subsides. In other children the vaginal discharge may persist for months. To understand the variation in the clinical course in these little patients, one has only to keep in mind the fact that the gonococcus is a pyogenic organism that causes ulceration, and that in any gonorrheal inflammation mixed infection is the rule. The clinical manifestation of a gonorrheal vaginitis in the period just following the infection, often proclaims the severity of the process, and makes easily understood some of the sequelae which are seen later in life. Other things being equal, the amount of discharge and its persistence will depend upon the extent of ulceration. A discharge will continue until the ulcerated vaginal areas have been replaced by healed scar tissue, or until apposing granulating surfaces become united, and the obliteration of those surfaces is thus accomplished. It is doubtless just as true in gonorrheal vaginitis in children, as it is in urethritis in the male, that the less marked lesions may heal, leaving no trace. In every case, however, in which ulceration and mixed infection are pronounced, sequelae are certain to result. It is obviously quite impossible to estimate with any degree of accuracy the percentage of permanent structural changes that follow vaginitis in children. Probably, however, it is not high, inasmuch as some men of large experience have never encountered a case. That these changes do not occur more frequently is rather surprising, when one considers the delicate vaginal membrane of the child, and the indifference and difficulties encountered in the treatment of these infections.

The structural changes found in the adult vagina as a result of gonorrhea in early childhood, may be divided in two groups: a narrowing of the vagina due to scar tissue involving to a greater or lesser degree its circumference, and a more extensive condition, consisting

of partial or complete obliteration of the vagina, brought about by the fusion of vaginal surfaces. It is seldom that either of these types is discovered until the woman marries. The first type may be found during a vaginal examination prompted by other conditions, or the stricture may interfere with normal married life to an extent that will lead to the discovery of its presence.

In cases belonging to the first group a wide variation in the extent of scar tissue is found but usually it is not sufficient to produce trouble. The examining finger comes in contact with a cord-like process felt in the vaginal wall. The lateral walls are the most frequent location. In view of the fact that such conditions do not interfere with normal processes, they possess but little clinical interest. The writer has met with a number of such conditions that were presumably the result of gonorrhea, but in only one could a definite history of a vaginal discharge in childhood be obtained.

In the cases belonging to the second group, the obliteration of the vagina naturally prompts an examination after marriage. In this group the vaginal defect is marked and the vagina is found almost completely closed, with the exception of the lower one, or one and a half inches. The vagina is represented by a pouch an inch or two in depth. Somewhere along the line which marks the fusion of the vaginal walls, is located the opening connecting with the uterus. This external opening may be extremely small and difficult to locate, and when found may admit only the smallest probe. Beyond this point the fusion of the vaginal walls will vary in extent. The fornices of the vagina in some instances may not be involved, while in others the vaginal walls may closely encompass, and be adherent to, the cervix.

The union that takes place between the vaginal walls is very firm. In the cases described, and in those seen by the writer, there has always been the small pouch representing the vagina just inside the vulva. This rather constant lower limitation to the vaginal adhesions may possibly be explained by the fact that the lower end of a child's vagina is gaping. If the labia be separated, and if the opening of the hymen be not too small, one may easily see the portion of the vagina just above the hymen as a cavity. At puberty the development of the levator muscles and the vaginal constrictors bring the lower part of the vaginal tube closely in contact. The fact of the imperfect vulval closure in the child may possibly explain why the bath tub commonly acts as the medium of infection in some of the institutional epidemics of vaginitis. The water of the bath finds ready entrance to the vagina, and if germ laden, infection is accomplished.

The writer's experience with acquired vaginal atresia as a result of infantile vaginitis, is confined to three cases.

The first was a young woman of nineteen who began menstruating at sixteen. With each period she experienced much pain, and the flow came very slowly. The

feeling complained of was that of pressure in the vagina. Increasing discomfort with each month's flow, prompted an examination. It was found that the vagina was closed an inch and a half from the hymen by the firm union of the vaginal walls. No attempt was made at this time to find the opening along the line of union. Later, under anesthesia, a small opening was found that admitted only a probe. The union of the vaginal walls was dissected for about one half inch. Above this was the vaginal cavity where an adhesion of much lesser extent was found and corrected. Following this procedure menstruation occurred without pain. A year later the young lady married, and although no examination was permitted, her married life was reported normal. The discomfort at menstruation in this patient was due to the small opening not permitting a sufficiently rapid discharge of the menstrual fluid. During the time when the discharge from the uterus became greater than could be drained by the fistula through the atresia, the accumulation produced pain and pressure. Based upon the best of circumstantial evidence the cause of this atresia was an infantile gonorrhea. The mother stated that when the girl was four years old a persistent vaginal discharge required treatment for nearly a year. The mother herself gave a distinct history of pelvic inflammation, following which she had had years of pelvic symptoms, and finally she was operated upon by the writer for a chronic gonorrheal pelvic pathology.

The other two cases of atresia may be briefly cited. A Russian Jewess, twenty-six years old, four months after marriage consulted the writer because intercourse was impossible. Examination showed the vagina to be represented by a shallow pouch. The opening connecting with the uterus could not be found. The patient was requested to return during her menstruation, at which time it was possible to locate the lower opening of an apparently tortuous channel. At operation extensive vaginal adhesions were found to almost completely obliterate the vaginal tube. Following this attempt to open the vagina, although there was much improvement, in two months a second operation was undertaken, followed by vaginal dilatation. Shortly after the second operation pregnancy occurred. The labor was terminated by a difficult forceps delivery in the hands of a competent obstetrician. The baby died. Examination three months after this labor showed considerable scar tissue in the vagina, but a lumen that admitted two fingers comfortably. Pregnancy again took place and at term the woman was delivered by abdominal section with happy results. No history could be obtained here of any discharge during childhood. The patient could not, however, give any information concerning her early childhood in Russia, and there was none of her family who could supply such information. While in this case all direct evidence of infantile gonorrhea was wanting, the atresia was in the writer's opinion undoubtedly due to such a cause.

The third case was a young woman of twenty-three, married three months, referred because intercourse was impossible. Examination showed that the vagina was closed an inch and a half beyond the introitus. At operation, after dividing the lower union, a small vaginal cavity was encountered, and above this the vaginal walls were found closely adherent about the entire cervix and united in front of it, in such a manner that it was with considerable difficulty that the os was finally located and the cervix freed by a careful dissection. Very shortly after the patient left the hospital she became pregnant. At the seventh month of pregnancy examination showed the cervix free of adhesions. The obstetrician in whose hands this patient was placed deemed it wisest to deliver by abdominal section. This patient was able to secure the information that in early childhood she had had a profuse discharge that persisted for many months. Although positive evidence proving the source of this discharge to be a gonorrhea is wanting, our knowledge today of such conditions justifies an assumption that the gonococcus was the exciting germ.

If we grant that all such cases of atresia and stricture are due to a gonorrheal vaginitis that existed in childhood, it presents a strong argument for more prompt and active treatment of these discharges.

The operative technic for the relief of atresia of the vagina must depend naturally upon the needs of each individual case. There are a few general principles that can be applied, however. In atresia due to the union of vaginal surfaces, the dissection should be most carefully done, and when possible it should be accomplished by the finger. The sharp knife, unless great care is used, will penetrate into the deeper layers of the membrane, thus favoring the development of a scar in the deeper structures. A denuded vaginal surface in contact with a similar denuded area, will result in their union. If, therefore, after separating an area of vaginal union, it is possible to do on one wall a plastic procedure that brings an area of normal epithelium opposed to the denuded area of the opposite side, the denuded area will in due course be covered by a modified epithelium, such as is seen in the scar of the lacerated perineum. Where this cannot be done, the surfaces separated must be kept apart by frequent packing with iodoform gauze heavily impregnated with vaseline.

The atresia due to stricture seems to present greater difficulties than the atresia due to vaginal adhesions. As a rule the scar of these strictures is deep and its base broad. Before proceeding with the operation itself the strictures should be most thoroughly stretched with dilators and finger, until sufficient dilatation is obtained to permit one to determine the limits of the scar. Good dilatation also affords greater room for any plastic work. Plastic procedures are difficult. If the scar be not too wide, a resection of a part of the circumference of the stricture should be done, substituting for the resected portion, a union of membrane drawn from above and below the scar. This procedure was helpful in one of the writer's cases. Whatever operative plan is adopted, the vagina should be systematically dilated as soon as possible following the operation. In two of the writer's cases pregnancy took place within four months after operation. It would seem that the vaginal congestion accompanying pregnancy renders contractions of scar less prompt.

The question as to how such patients are to be delivered must of course be decided in each case by the condition of the vagina. If a delivery through the natural passages can be terminated with safety to mother and child, there can be no question as to the advantage derived from the dilatation. It would seem that such cases might also present a valid indication for the induction of premature labor. If however, considerable resistance is offered to the progress of the head, the chances that a premature infant will survive the labor are rather remote. For the safety of the child abdominal cesarean section undoubtedly is the best procedure.

DISCUSSION

DR. CHARLES W. MOOTS, TOLEDO, OHIO.—I desire to present the two following cases of congenital atresia of the vagina.

CASE 1: Patient, age twenty-three, rather short and stout with a very short neck. Family history negative except that the patient and a younger sister were both psychoneurotic. She was referred to me by an internist, not because she was sick but because she had been sent to him owing to the fact that she had never menstruated. I found no evidence of endocrine disbalance, the usual growth of hair was present in the axillae and in the pubic region, the vulva and clitoris were perfectly normal. There was present a thin, red streak about two inches long where the introitus should have been. On careful rectal examination I found absence of the uterus, ovary, and tube on the left side; but a small mass, probably an ovary, on the right side. She had never had any violent love affairs, she had no desire to marry, she was happy in her work, and apparently had no sexual feeling. I advised no treatment whatever in this case, except that she return to the village where she was teaching and try to absorb herself in her work.

CASE 2: Patient thirty years of age, married and the mother of two children. She was not brought on account of illness, but because her family physician had found a peculiar condition of the vagina, which was double, the tracts being of about equal size, the septum in about the midline, and deflected to the right side of the cervix, ending in a blind pouch. The doctor said this septum stretched easily on delivery, there was no difficulty whatsoever, and he simply wished to know what to do about it. In this case I also advised no treatment.

DR. FRED J. TAUSSIG, ST. LOUIS, MISSOURI.—I think it is well that Dr. King has emphasized the significance of gonorrhea in children and its seriousness. Having had occasion to be in charge of a clinic for the study of such cases, and having followed them for a long period of time, I am in doubt as to the responsibility of this form of vaginitis as a cause of atresia. Nagel and Veit claimed that atresia of the vagina was due to an acquired vulvovaginitis in children. That statement has been passed down from year to year and has been accepted by many but I defy anybody to show me proof that vulvovaginitis produces atresia of the vagina. If so, why do we not find strictures of the vagina more frequently? Gonorrhea in children is very common, but Dr. King was able to find only one case of stricture. Why do we not find any intermediate steps in the production of the atresia? If it produces a complete obliteration we should find stricture frequently. We do find it occasionally, I grant you that, but we should find many cases. The development of the hymen shows that there is a tendency for the obliteration of that portion of the tract, and I believe we must accept the theory that these so-called atresias are congenital and are only noticed later in life, because only upon the onset of menstruation do they give symptoms.

DR. IRVING W. POTTER, BUFFALO. N. Y.—I have no cases of atresia to report, probably because most women are pregnant when they come to me. I had the pleasure of delivering both of the patients the doctor mentions. The first by cesarean section, because she had lost her first baby. The second case I delivered without the knowledge of Doctor King. She was seen by him at the seventh month and he thought she could be delivered. I thought she could not be, so I sectioned her with equally good results.

DR. CHARLES E. RUTH, DES MOINES, IOWA.—I wish to speak of two cases, one congenital. Both of these patients were school teachers. One was pregnant and sought to terminate this by the introduction of several 7½ grain tablets of

bichloride of mercury into the vagina, with the result that she had mercury poisoning that came near terminating her life. She lost the fetus and she also lost the entire vagina, because it was obliterated absolutely from cervix to vulva, with the exception of a drainage tract too small to permit the passage of even a small probe. After she had suppression of the menstrual flow, her physician persisted until he got a probe in, making an opening which permitted a menstrual flow. This had so contracted when I saw her that it could not be followed by a probe. She insisted on the construction of a vagina but the attempt to reconstruct a vagina from the labia has not, to the present time, been entirely successful.

The other patient consulted me because she did not menstruate. She was normal in development and sexual feeling, masturbated and found great difficulty in controlling that tendency. I could find no sign of a vagina, uterus, and ovaries except that, on the right side, there seemed to be a little thickening or cordlike structure extending from what should have been the top of the vagina. So I presume she had a vestige of an ovary on that side which accounted for her sexual tendencies.

DR. HUGO O. PANTZER, INDIANAPOLIS, INDIANA.—Forty years ago, as a dispensary interne, I had such a case. When first seen by me the patient had been in labor for forty-eight hours with a breech presentation, making little headway against an almost obliterated vagina, owing to scarring by nitrate of silver, which had been used on venereal warts. The dead fetus was finally delivered by embryotomy.

DR. KING, (closing).—As Dr. Taussig has said, it is very difficult to determine with absolute certainty the cause of such atresias as I have described. In every case, unless there is a clear history and record of examination during the presence of discharge, there will always be a question as to the bacterial factor where atresia is discovered later in life. Where atresias are due to streptococcus or diphtheritic infection in childhood there would be a clear history indicating the severe constitutional reaction associated with such infections.

As to the frequency of these atresias we might also ask why strictures of the male urethra do not occur more commonly. It is doubtless true that the vaginal mucous membrane of the child is more resistant to the ulcerative process than the urethra. This subject has been presented with the purpose of bringing to your attention this sequela of vaginal discharge in children to the end that it may prompt a more careful study of such cases.

A STUDY OF THE CASES OF CARCINOMA MAMMAE OPERATED UPON BY MYSELF AND THE END RESULTS OBTAINED IN THEM

By J. E. Sadlier, M.D., F.A.C.S., Poughkeepsie, N. Y.

IN THIS paper it is my purpose to bring to your attention a brief study of all the cases of carcinoma of the breast operated upon by me during the past twenty years, that is, from January 1, 1900, to January 1, 1921.

A very determined effort was made to trace all cases. Fortunately our records were rather definite as to naming some relative, and this helped materially in finding out the end results in the case of those who died. Hence, I am pleased to report that each one of the entire series of 70 cases, operated upon during this twenty year period, has been definitely traced and the end result determined. In this particular the record is somewhat unusual.

In our case histories we have been most anxious to determine the length of time the growth has existed prior to operation and, whilst in a few we have definite information, yet in the main the question is most indeterminate, as the patient usually discovers the tumor after it has been in existence for many months. Therefore, what knowledge we have on this subject is of no material value.

All operations in this series have been of the radical type and, whilst we have varied from time to time with reference to plan of skin incision, method of approach to axillae, the particular type of plastic closure, etc., we have, nevertheless, always kept steadfastly in mind the necessity for removing all possible cancer-bearing tissue, as was so ably brought to our attention during the last decade of the nineteenth century by Halsted, Myer and others; and still later by the splendid studies of Handley. Hence, the pectoral muscles, with the exception of the clavicular portion of the major, have been sacrificed, the axillae carefully dissected and, where it was involved or suspected of being involved, the supraclavicular region was also cleared of all glandular and fatty tissue. Vast areas have had to be skin grafted, or plastic operations performed, to cover, where by reason of the extensive character of the neoplasm it had seemed best to sacrifice much skin. In fact, no incomplete operations were done. In some cases it was necessary to perform secondary operations for local recurrence or for supraclavicular involvement which had not been suspected at the time of the primary operation. Thus, we have all cases in this group upon the same basis insofar as completeness of operation is concerned.

During this period of twenty years, I can recall no patient who was refused operation; all patients who presented themselves were operated upon and given a chance. Though I am convinced that in certain cases this was a mistake and a mutilating operation was performed which in no way stemmed the course of the disease, still, in other cases that seemed quite as advanced, we have patients living years after the operation and free from malignant disease. Human judgment and laboratory studies of specimens removed seem inadequate to determine, definitely, what the outcome is going to be in any operated case. I do believe that, in the future, proper x-ray study of the mediastinum, bones, etc., prior to operation upon the breast will cause us to eliminate some cases that otherwise we would operate. In my recent work I have adopted this procedure.

All pathological specimens of this series were given careful laboratory study. In most instances frozen sections were made at the time of operation though they were always confirmed later by more deliberate and careful examination. Yet, I find that, in a few of our early cases, we have failed to record the exact type of malignancy. These we have placed in a separate table.

During the period involved in this series of malignant cases there were also operated 31 cases of benign tumor of the breast, including one case of tuberculosis. These were, naturally, less extensive operations, excisions, simple amputations, subcutaneous amputations, etc. The relative proportion of benign to malignant tumors, 1 to 2¼, is somewhat greater in favor of the benign than is usually considered to be correct. These benign cases have been traced and all are found to be living; and in no case has malignant disease developed, which speaks forcibly for early operative treatment of benign tumors in the mammary gland; whereas, we have amongst the series of 70 malignant cases patients who were known to have had simple tumors of the breast for many years which later became malignant and were subjected to radical operation with only the usual modest percentage of ultimate cure. For example:

Mrs. H. M. G., age fifty-three. Marked family history of cancer. Mother of six children. No difficulty with breasts during lactation. About three years prior to operation, patient noticed a small lump in right breast. It was not painful and pronounced a benign tumor by a prominent surgeon who counselled against removal, although a certain amount of x-ray treatment was prescribed and applied without benefit. It was later punctured by the same surgeon under the suspicion that it might be a cyst. During the three years that it was being watched and treated from the nonsurgical standpoint, it gradually increased in size. Finally, when there developed within it sharp stinging pains, its removal was sought. It was freely movable and there was no palpable axillary involvement. Because of suspicion that there was danger of it, ultimately, becoming malignant, an operation was decided upon. A frozen section made at the time of removal proved it to contain a carcinomatous area. Hence, a radical operation was performed. This was done in March, 1907. The patient is still living and without recurrence.

No effort has been made in this study to separate the cases with glandular involvement from those with no such palpable metastases. We feel that such distinction, without referring to the certainty that goes with mediastinal or remote glands, is of value from the standpoint of prognosis. According to Halsted, cases without glandular involvement have about a 70 per cent chance of cure, whereas those with such involvement have but a 25 per cent prospect of ultimate recovery. Recent statistics received from Sistrunt of the Mayo Clinic (personal communication) shows 64 per cent of cases with no glandular involvement alive without recurrence from five to eight years after operation, whereas only 19 per cent of those with glandular involvement are alive and free from recurrence for the same period. These figures are convincing and leave no argument as to the necessity for early radical operation. It is a settled question that cases with glandular involvement have a decreased chance of cure; but, as malignant breasts have an operability of about 100 per cent, at least it was so determined in this series, we have to take them as they present themselves and do the best we can for them.

Therefore, for the purpose of this study and in order to determine the final end result in a series taken in the condition in which they present themselves, it is best not to attempt such differentiation; especially when we consider that, in many cases, such determination can only be arrived at after operation and pathologic study; and even then it is not absolute unless a vast number of sections have been made. Hence, we are interested in knowing and publishing the end results from cases taken as they came, regardless of the stage of disease, thereby endeavoring to bring to public notice statistics which will be

TABLE I

TOTAL NUMBER OF CASES OF CANCER OF THE BREAST, 70

TYPE	NO.	PER CENT
Scirrhus	34	48.5
Medullary	17	24.2
Type Unknown	7	10.
Adenocarcinoma	6	8.5
Duct	3	4.2
Sarcoma	2	2.8
Cyst Carcinoma	1	1.4

TABLE I (a)

AGES OF THE SERIES	NO.	PER CENT
21 to 30	1	1.4
31 to 40	8	11.4
41 to 50	18	25.7
51 to 60	24	34.2
61 to 70	11	15.7
71 to 80	7	10.
Over 80	1	1.4

convincing that operative procedure has a definite life-saving value as based upon present condition of public knowledge and methods of surgery. I am pleased to report that in this series there was no operative mortality, all patients having left the hospital alive.

I have definitely determined that, of the 70 cases of the series which includes two cases of sarcoma, we have alive and free from recurrence 23 cases, representing 32.85 per cent of the total number operated. (Tables IV and IV (a).) There have died from other conditions, *without* recurrence of carcinoma and with an interval of one to ten years of perfect health conditions, ten patients, representing 14.2 per cent of the whole series. (Table III.) These added to the 32.85 per cent living without recurrence, makes a total of 47.05 per cent who are either living without recurrence or dead of other conditions without recurrence.

I appreciate the fact that there are five cases operated within the

TABLE II

NUMBER OF DEATHS IN THE SERIES FROM CANCER, 36 OR 51.4 PER CENT

TYPE	NO.	% OF DEATHS	% OF TYPE
Scirrhus	16	45.6	47.0
Medullary	11	31.4	64.7
Type Unknown	5	13.8	71.4
Adenocarcinoma	1	2.8	16.6
Duct	2	5.6	66.6
Sarcoma	1	2.8	50.0

TABLE II (a)

Died under one year after operation,	20
" " two years " "	8
" " three " " "	4
" " four " " "	1
" " six " " "	1
" " seven " " "	1
" " eight " " "	1

TABLE III

NUMBER DYING FROM OTHER CAUSES, WITHOUT RECURRENCE, WITH NUMBER OF YEARS AFTER OPERATION

	NO.	TYPES
Under 1 year,	1	Scirrhus
After 1 year, under 2 years	1	Scirrhus
" 2 " " 3 "	3	Scirrhus Duct Cyst
" 3 " " 4 "	2	Scirrhus Type unknown
" 5 " " 6 "	1	Medullary
" 10 "	2	Scirrhus Adeno
Total, with per cent of the series,	10	14.2%

TABLE IV

NUMBER LIVING WITHOUT RECURRENCE, 23 OR 32.85 PER CENT OF SERIES

TYPE	NO.	% OF LIVING	% OF TYPE
Scirrhus	12	52.1	35.2
Medullary	5	21.7	29.4
Adeno	4	17.3	66.6
Sarcoma	1	4.2	50.
Unknown Type	1	4.2	14.2

TABLE IV (a)

LIVING WITHOUT RECURRENCE, WITH NUMBER OF YEARS

Over 1 year	3
" 2 years	2
" 3 "	2
" 4 "	4
" 5 "	1
" 6 "	1
" 7 "	2
" 8 "	1
" 9 "	1
" 10 "	1
" 12 "	1
" 14 "	2
" 15 "	2
	23
Living with recurrence after three years, ...	1

TABLE IV (b)

Living more than three years after operation		
Number		Per cent of series
18		25.7
Died of other causes, after three years, without recurrence		
Number		Per cent of series
8		11.4
Total number cured, based on three year period		
26	or	37.1 per cent

past three years, included in this series of cases without recurrence, that are still in the doubtful stage. But, as this paper has to do with our result after a 20-year period rather than some particular period after operation, I feel that it is correct to incorporate them. Nevertheless, let us consider the series from the standpoint of those living three years from the time of operation and free from recurrence. (See Table IV (b).) Here we find that 26 cases, or 37.1 per cent, of the series are alive or dead of other conditions, three years or more after operation and without recurrence of cancer.

As one studies his cases and the tables here shown, he is impressed with the well-known thought that cancer varies in grade of malignancy and virulence much as other diseases do. Representing this

point as to the extremes of malignancy, I would briefly describe the the following cases:

Miss E. T., age thirty-two. This case, classified under Table II (a), is distinctive of the type of cancer of extreme malignancy. She died within one year following the date of operation and is, perhaps, of a type which would be quite as well off with a simple amputation, as no operation seems to be of any lasting benefit. Previous to September 7, 1902, patient had no knowledge whatsoever of the existence of any tumor. Upon said date she discovered a distinct hardness of the right breast and within three weeks thereafter entered the hospital for operation. A diagnosis of extensive cancer of the breast and axillary glands was established. A radical operation was performed followed by uneventful recovery. Type of Cancer: Duct carcinoma. Within a few weeks there was extensive recurrence in the region operated upon which extended throughout the shoulder. Patient died within six months of both external and internal cancer. The rapidity and virulence of the growth leads one to suppose that the operation spread the malignant process more rapidly than would have been the case without surgical intervention.

Mrs. J. W., age sixty-five. This case represents a cancer which has been in existence for a long period of time and one doubts the wisdom of operative procedure; yet later events prove that, occasionally, such a case is cured, the patient living for many years, finally to die of some intercurrent disease. For three years this woman had a painless, but gradually enlarging, tumor of hard consistency developing in the right breast. She had been repeatedly advised to have it removed, and it was only after it had ulcerated and was of extremely offensive odor, that she finally consented to enter the hospital for operation. At this time the glands in the axilla showed marked involvement and the patient was greatly emaciated. At the time of operation a cure could hardly be looked for. Nevertheless, a radical operation was performed. The patient made an uneventful recovery, living ten years without recurrence and finally died of pneumonia.

Thus recognizing that the degree of virulence of the disease is one of the greatest factors in determining the result, may it not be possible for us to make a more intensive study of each case prior to operation and, thereby, anticipate some of our unfortunate results? For instance, given a case in a relatively young person with rapid development of growth and early involvement of glands, would it not be wise to assure ourselves, prior to operation, that there is no mediastinal or bone involvement, and inquire most carefully as to the presence of a cough, dyspnea or other evidence of involvement of the chest, as well as carefully examine the liver and investigate all other organs of the body? The fact that 20 or 28.5 per cent of this series died within one year after the operation, inclines one to consider that amongst the number there must have been some who were hopeless, and who should not have been subjected to mutilating operation.

In contradistinction to the above are the cases occurring in older people, where the disease has been in existence for from one to three or four years, and in some of whom there is supraclavicular as well as axillary glandular involvement, but no evidence of intrathoracic or distant metastases. Here we have, in spite of the long existence of the

growth, a fair prospect of ultimate success. My experience coincides with that of Pilcher with respect to the possible curability, by operation, of cases where there is supraclavicular involvement. It is high time that we throw into the discard the old idea that such involvement renders a patient hopeless. Case 14 of this series, operated March 1906, had extensive supraclavicular involvement and is in perfect health 15 years from date of operation. Another case with extensive involvement above the clavicle, lived for six years and died of other conditions; a third case lived for ten years without recurrence.

In Table II (a), we notice that 32 of the 36 deaths from cancer occurred within the three year period. This adds strength to the argument that patients are relatively safe who have passed three years after operation without recurrence; especially is this so when we analyze some of the so-called late recurrences for, frequently, we are apt to find that we are not dealing with a metastasis but rather with a definitely new development, as evidenced by the different type of cell. The following history is instructive from this standpoint:

Mrs. J. T., age sixty. Operated upon June, 1904, for a carcinoma of the left breast, which had been in existence, apparently, only one month. A complete radical operation was performed which necessitated extensive skin grafting. An examination of the specimen showed it to be medullary carcinoma. The patient made a good recovery. However, a few months later it was necessary to perform an extensive operation to remove carcinomatous glands, which had developed in the supraclavicular region. From this operation she also made a nice recovery and remained perfectly free from cancer for six years. Then she developed suspicious symptoms in the bladder. A cystoscopic examination disclosed the fact that there was a malignant area within this organ. June, 1910, six years after the breast amputation, a transperitoneal section of her bladder was performed and the diseased area removed. Examination of specimen proved it to be carcinoma which had developed upon a preexisting papilloma. She recovered nicely from the operation and remained free from any recurrence in the bladder, but later she developed carcinoma of the liver and died. Here we have a case where there is an interval of six years between the removal of the breast and the beginning of the bladder growth. The cell type was different in each case. Hence, the growth in the bladder can hardly be considered metastatic from the carcinoma of the breast.

Table I, relating to type of cancer, shows about the customary proportion of medullary cancer to scirrhus; 24.2 per cent of former, and 48.5 per cent of the latter; but the number of adenocarcinomas is quite below the average, being only 8.5 per cent. The only noteworthy thing with reference to the age of the patients in this series is that nine, or 12.8 per cent, were under forty years of age. Eight of them are dead of recurrence of cancer; the ninth one died some ten years after the operation of other conditions but without a recurrence of cancer. Hence, if we classify this one case as cured we have about 11 per cent of recovery for this group. Of those living without recurrence, the adenocarcinoma cases show 66 per cent of ultimate recovery which

represents a high percentage of cure and corresponds with the usual well-known favorable results in this type of cancer. Scirrhus has to its credit 35.2 per cent without recurrence and, as might be expected, the medullary type is the least favorable with only 29.4 per cent living and free from recurrence.

These figures are so nearly in accord with those of other investigators that one is impressed with the definite exactness with which the percentage of cured cases can be determined from the type of cancer. Furthermore, one recognizes that these figures demonstrate that, in a given series, a certain proportion can be cured by radical surgical operation; and this percentage of cure is, probably, as great as operative procedure will obtain, although moderate advantage and increased curability may result from the more general use of x-ray and radium as adjuncts to the operation. Yet, the great loss of life that appertains in this disease, in spite of the most perfected treatment, will only be lessened when the people have learned to know the great advantage of early surgical intervention of the radical type and when they present themselves early. At the present time many patients come to see us when they are so far advanced that the prognosis is grave. Those representing the degree of extreme virulence, and those in earlier life, will have a very modest percentage of cure even though they present themselves for early radical operation.

DISCUSSION

DR. LEWIS F. SMEAD, TOLEDO, OHIO.—In the diagnosis of extensive breast tumors it has been my custom to have the chest x-rayed, to determine the presence of any glandular involvement. In a number of cases no operation has been performed, because of the determination of glandular involvement in this way. I have not been accustomed to remove the supraclavicular glands by operation, but have this region thoroughly treated by x-ray in order to prevent malignant involvement. It is also my custom to turn the cases over to a careful roentgenologist for thorough x-ray treatment after operation. If this is to be of any advantage it must not be done half-heartedly, but by a competent operator.

GYNECOLOGIC OPERATIONS UNDER LOCAL ANESTHESIA

By Robert Emmett Farr, M.D., F.A.C.S., Minneapolis, Minn.

THE sensory nerve supply of the pelvis is fairly accessible. The sacral plexus and the pelvic plexus of the autonomic system furnishes with sensory nerves the organs with which we have to deal. The blocking of these nerves, therefore, allows the performance of operations upon the whole of the vaginal mucous membrane and the labia, but not upon the clitoris,without blocking the nerve supply from above. All except these nerves may be reached by an infiltration block, or by the induction of caudal anesthesia. The uterus and adnexa receive additional sensory innervation from the pelvic splanchnic nerves of the autonomic system.

The interception of the sensory nerve supply to the pelvic organs is simple and comparatively certain in all cases in which adequate exposure of these structures can be obtained. The securing of this exposure anticipates complete abolition of the reflexes of the abdominal wall with resulting negative intraabdominal pressure and the use of gravity to carry the intestines away from the field. In order to successfully block the sensory nerve supply of the pelvic organs after the abdomen has been opened it is obviously necessary to visualize the points at which the blocking is to take place. There are a number of conditions which interfere, in varying degrees, with this visualization. The presence of uterine myomata, or other tumors with abbreviated pedicles may interfere because it is impossible to move them out of the field without causing the patient pain. Acute or subacute inflammatory processes may render peritoneal surfaces so sensitive that a negative intraabdominal pressure cannot be obtained, and the field be obscured by the presence of coils of intestine. Gaseous distention is a common cause of embarrassment, and in some cases even the most perfect blocking of the abdominal wall will not prevent an involuntary expulsive effort on the part of the patient, giving a condition which will be best met by the use of mixed anesthesia.

We have, as a rule, used direct infiltration in anesthetizing the abdominal wall. With the pneumatic injector anesthesia may be established in from two to three minutes, and with almost no margin of error. The solution is, by the infiltration method, brought directly into contact with the ultimate arborizations of the sensory nerves, where it is most efficient, and the edematization of the tissues interferes neither with the performance of the operation nor with healing. Sensitive cases should have the abdominal wall lifted by means of towel

clips in order to avoid pressure upon the viscera while making the incision. While entering the abdomen, muscle spasm should be watched for, as an evidence of incomplete anesthesia, rather than complaint of the patient. Complete abolition of the reflexes should be aimed at, and, as stated, perfect anesthesia will usually show a pelvis free of small intestines when the abdomen is opened. As an additional aid we have made use of pneumoperitoneum, the gas being introduced just before opening the abdomen, and we believe that this will prove to be an aid in emptying the pelvis. In case of marked ptosis, or bony deformity, we have not hesitated to turn the pelvic intestines out upon a rubber towel during the performance of the operation. If this is carefully done, avoiding tension upon the mesentery, and extremes of temperature, it is not a painful procedure. Provision should be made for placing the patient in extreme Trendelenburg, and for tilting the table laterally, without causing the patient discomfort. Provided a preliminary caudal has been made one may not find it necessary to reinforce the anesthesia after opening the abdomen. Where transsacral anesthesia has been employed reinforcement is not necessary. Reinforcement, when necessary, may be made by the use of an anterior splanchnic at the pelvic brim, or by an infiltration block along the lines which the nerves are known to follow, and depending somewhat upon the operative procedure which is to be carried out.

In simple operations, such as suspension, blocking of the round ligaments will suffice. This should be done as follows: Vertical retraction of the abdominal wall exposes the round ligament near its distal end, where it may be steadied while the point of a long needle is inserted into it. In some instances the ligament may be best approached by passing the needle through the abdominal wall. In any case it is to be thoroughly edematized. The same procedure is then carried out on the other side, with the operator making the retraction and the assistant the infiltration. Work upon the ovaries requires an infiltration of the ovarian pedicle. Complicated tubal disease, in many instances, requires transsacral or splanchnic anesthesia, but, with a perfect exposure, sharp dissection and the avoidance of traction it is surprising how much may be done with direct infiltration only. Abdominal hysterectomy may be done under sacral, transsacral, or direct infiltration. The uterine cervix should be surrounded by a subperitoneal infiltration, and the fluid should be used liberally between the cervix and the bladder, and the cervix and the rectum. This has the effect of separating the cervix from these hollow viscera, and simplifies the dissection.

As stated above, the main obstacle to success is inadequate exposure from any cause. Incomplete anesthesia of the abdominal wall, too vigorous retraction with rigid instruments, marked ptosis, gaseous

distension, hypersensitiveness of the intraperitoneal viscera due to acute or chronic inflammatory processes, the presence of large tumors with short pedicles, or even a full bladder may make the completion of the operation under local anesthesia impracticable.

Ovarian cysts of any size may be evacuated by suction, and we have for a number of years operated upon all of our cases under local anesthesia. Dermoids, intraligamentous cysts and subperitoneal fibroids may be handled by the same technic, provided the tumor can be grasped and sharp dissection made. Adhesions, contrary to the general belief, have only occasionally been the cause of failure. Perfect exposure, vertical retraction, and sharp dissection along the white line shows a marked contrast to the orthodox method of introducing the gloved hand and breaking up these bands by the use of the tactile sense alone.

The presence of abscesses and infective processes, while increasing the difficulty of using local anesthesia, serve well to illustrate the advantages of the method, providing operations can be performed under its use. Perfect repose of the viscera, the "silent abdomen," so-called, and the absence of engorgement, is in marked contrast to the condition which is apt to occur when general anesthesia is employed. This quiescence of the viscera not only permits of a more refined technic, but is an important factor in preventing the spread of infection. The rapid excursion of the viscera when a patient is under general anesthesia, the trauma produced by gauze packs, the distortion and displacement of the viscera which must take place during the recovery from general anesthesia, and the retching and vomiting incident thereto, must, in a certain percentage of cases at least, increase the possibilities of disseminating infection with its immediate and remote sequelae, and must, to a certain extent, upset the order in which the viscera were arranged before the abdomen was closed.

Pelvic abscesses which demand vaginal drainage do not lend themselves well to the use of local anesthesia. Many of these patients are in an extremely nervous and septic condition, and unless heavy preliminary hypodermic medication is employed, suffer more or less psychic shock. This is one of the conditions in which psychic incompatibility may be sufficiently marked to contraindicate the use of local anesthesia. Technically, the method also has objections. Nothing less than a transsacral will insure sufficiently complete anesthesia to allow one to drain multiple collections of pus in the pelvis by bluntly rupturing the abscess walls, which is necessary in a certain percentage of cases.

Practically all other gynecological operations which may be performed through the vaginal route are possible under the use of local anesthesia. The peritoneum may be anesthetized by an infiltration

block of the pudic nerves. The uterus may be completely anesthetized, allowing the performance of operations upon the cervix, and endometrium, after an infiltration block of the uterine ligaments through the vaginal vault. The anterior vaginal wall is best anesthetized by a circumferential infiltration. The same is true of the labia and clitoris. Vaginal hysterectomy and interposition operations, as well as vaginal hysteropexy, require sacral, transsacral, or an infiltration block of the peritoneum, and the broad and round ligaments. If only direct infiltration is used it is necessary to eliminate traction as far as possible, and to infiltrate the round ligaments high up as soon as their exposure has been accomplished.

One of the most common causes of complaint in sensitive individuals is due to stretching of the vagina with retractors. It is, in most cases, well to anesthetize the introitus before introducing the retractors. thus insuring more easy dilation of the vaginal canal, and eliminating discomfort from this cause.

We have in many instances, performed vaginal operations upon unmarried women, and occasionally upon young girls, under local anesthesia. Perfect anesthetization of the vaginal canal is especially important, even though only an intrauterine operation is to be performed. The relaxation, resulting from perfect local anesthesia, as evidenced by the easy dilatation of the vaginal canal, is most surprising, and permits one to perform operations upon these classes of cases with much less difficulty than might be anticipated.

The great advantage of the use of local anesthesia is manifest when both vaginal and abdominal operations are required in the same individual. In these cases the patient is inhaling no anesthetic during the period that must elapse between the operations, and before the abdomen is opened, anesthetization of the internal genital organs may be fairly well established from below. Cesarean section under local anesthesia is a comparatively simple procedure, and in a certain percentage of these cases, it is desirable to avoid the use of general anesthesia.

Large or firmly fixed tumors, malignant disease, or marked immobility of the pelvic organs from any cause, are the most difficult conditions with which we meet. Transsacral anesthesia will effectually prepare a patient for any of these operations, so that a reinforcement of the anesthesia will be found unnecessary. However, the technic necessary for the induction of transsacral anesthesia is complicated, it is difficult to acquire and difficult to execute. Patients who are very large or very fat place an additional handicap upon the method, as, in these cases the pelvis is usually deep, and the fat not only increases the distance of the organs from the surface, but, by its presence, is apt to obscure the view which is so essential when work-

ing under local anesthesia. It has been our plan to open the abdomen under local anesthesia, and where complicated pathology is anticipated, to precede this by the induction of sacral anesthesia. The operation is carried as far as practicable, and is completed, when possible, under local anesthesia. Should conditions that in any manner interfere with the carrying out of the procedure in a satisfactory manner present themselves, mixed anesthesia is employed. The rapid, smooth and peaceful manner in which these patients respond to light inhalations of gas or ether, when one's limit has been reached is in such marked contrast to the manner in which people usually submit to inhalation anesthesia, that one might almost feel like using local anesthesia as a preliminary to general anesthesia, in order to facilitate the induction of the latter. This method is so practicable, and its practice enlarges, with such rapidity, the scope of local anesthesia for the individual who employs it, that I feel no hesitation in recommending it. While the merits of mixed anesthesia, as recommended by Crile, are not to be doubted, its superiority over efficient local anesthesia alone is yet to be proved. Whether psychic trauma will be sufficiently reduced as patients develop the faith which will result from the performance of painless operations under local anesthesia, so that surgeons will consider it less of a menace than the inhalation of gas or ether, the future must decide. Surgical results are dependent upon many factors besides those relating to anesthesia alone, and excellent judgment and a highly refined surgical technic must be considered in tabulating results. At any rate, even admitting that mixed anesthesia is the method of choice at present, it must depend largely for its efficiency upon the completeness with which the local anesthesia is employed. Poor local anesthesia demands a greater amount of general anesthesia, and vice versa, and there would seem to be no question but that the method recommended above will much more effectively develop good local anesthesia than would be the case if consciousness is eliminated before local anesthesia is begun. Anoci association may be most effectively employed by the surgeon who has learned to do painless operations under local anesthesia before attempting it.

The use of local anesthesia in the tissues, even in cases in which complete anesthesia cannot be established, so greatly reduces the amount of general anesthesia and mixed anesthesia, as used by Crile and others and furnishes such excellent results, that it would seem desirable to begin at least a certain percentage of gynecologic operations under local anesthesia, or to use local anesthesia combined with a reduced amount of gas or ether, rather than depend entirely upon inhalation anesthesia as a routine procedure. Beginning operations under local anesthesia, and adding inhalation anesthesia as soon

as one's limit is reached in any particular procedure will be found to be the means of developing the technical ability of the operator, and general anesthesia will be found necessary less and less often. On the other hand, should the patient be anesthetized with gas or ether before the local anesthetic is injected the opposite tendency is more likely perhaps to be noted, and one's ability to develop a local anesthesia technic is apt to be somewhat retarded.

In conclusion, I would state that the most ideal condition which has presented itself to us for the performance of surgical operations has been brought about by the preliminary use of morphine, combined with magnesium sulphate, and the establishment of perfect local anesthesia. By this means psychic incompatibility is practically eliminated, although in a large percentage of cases the psychic element has seemed to us to be of minor importance. Mixed anesthesia has many points of advantage. My feeling is that local anesthesia alone, or combined with gas, or with the judicial use of morphine and magnesium sulphate, offers special advantages over other forms of anesthesia now in use.

DISCUSSION

DR. GEORGE GELLHORN, ST. LOUIS, MISSOURI.—I am filled with admiration of the ingenuity which led to the perfection of all these methods. To my mind the development of local or any anesthesia that is apt to restrict inhalation anesthesia is a great step forward in the safety and success of our operations. I have learned a great deal this morning and shall begin to emulate, as far as possible, the work of Dr. Farr. I have been using local anesthesia in the work upon the cervix and have found it very simple. I have, however, been unsuccessful in working upon the perineum and would ask Dr. Farr to touch upon this in his closing remarks. I have tried to block the perineal nerve where it curves around the spina ischii, but my efforts have thus far been unsuccessful.

I am particularly impressed with the procedures that take the comfort of the patients into consideration, such as their being lifted about.

DR. A. J. RONGY, NEW YORK CITY, N. Y.—There is no question but that Dr. Farr has worked out local anesthesia very beautifully, but I believe the operator is not quite free to discuss the advantages and disadvantages of the operation when the patient is fully conscious, and that robs it of its usefulness in teaching when the patient is in the operating room. I have had some experience with sacral anesthesia in varous operations and, it seems to me, that some trophic disturbance takes place and the wound union is not so good as it might be. In one case a recto-vaginal fistula developed. I would like to know what Dr. Farr's results are. Is his percentage of primary unions as good under local as under general anesthesia?

DR. WILLIAM SEAMAN BAINBRIDGE, NEW YORK CITY.—Referring to Dr. Rongy's remarks, it has been my custom to do practically all goiter work under local anesthesia. I have been unable to detect any difference in healing when the patient is given local anesthesia or placed under a general anesthetic, neither have I found local anesthesia of any great disadvantage in teaching. A preliminary dose of morphine usually dulls the general sensibilities sufficiently. A touch of psychic anesthesia is of value, tell the patient that what she is doing is of great service

to humanity; tell her a little of what is going to happen, and I think you will find that she will respond by helping the operator.

Regarding the addition of magnesium sulphate, I can only speak from experience with a few cases, but it seems that Gwathmey has added something to anesthesia —prolonging the effect and lessening certain disagreeable results.

DR. FARR, (closing).—With regard to the perineum, I would say that we use caudal anesthesia or an infiltration block. By going well out to the side there is nothing that can be injured, and by keeping the needle point on the move one may put in an ounce or two of the solution. In this way the nerve supply is sure to be reached.

My experience agrees with that of Doctor Bainbridge. This can be made an absolutely painless operation. Infiltration can be done in two minutes and it is so simple that I have for many years used only local anesthesia in these cases.

Charity cases are not good subjects for the use of local anesthesia, unless one has a reputation with this class of people for doing painless operations. I tried to develop my technic for local anesthesia upon this class of cases at the time I was teaching in the University of Minnesota. In 1914 I resigned so as to devote myself entirely to my private practice, for I found that I could get along so much better in the work when operating upon patients with whom I was acquainted.

We never talk to our patients before operation, if we can avoid it. If the patient brings up the subject, I ask her whether she is not willing to leave the details to me, and, as a rule, patients will say "Go ahead, and use your own judgment."

We have done approximately seventy-five abdominal hysterectomies, 25 per cent of which included the removal of the cervix. We have also done twelve or fifteen vaginal hysterectomies. We, therefore, believe that with a little experience men should do at least the simple things under local anesthesia, on account of its safety and other advantages.

We have had no difficulty with healing of wounds.

SUPPURATING UTERINE MYOMATA

By Wm. Edgar Darnall, M.D., F.A.C.S., Atlantic City, N. J.

SUPPURATING uterine myomata are divisible into three definite classes: (1) subperitoneal, (2) interstitial, (3) submucous. Only those cases in which pus formation occurred in myomata situated on the outer surface of the uterus or located in the musculature, are described. The submucous variety has certain characteristics that are totally different from those of the other two classes and are, therefore, not discussed in this study.

Necrosis of myomata is fairly common, much more so than suppuration. It is liable to occur in subperitoneal, interstitial or submucous tumors but, more especially, in the submucous nodules. It is more prone to develop in the larger tumors, but has been noted in even very small myomata.

The necrotic areas are recognized as dirty gray, grayish, brown or dark reddish blue patches in the myomata. Such areas are clearly outlined; but the contrast between the myomatous tissue and the degenerated portion is not nearly so clear as in the cases where hyaline degeneration exists. In the necrotic areas the muscular striation is, usually, still visible, but the tissue is softer than usual. The necrosis is, usually, in the center of the tumor but may be noted near the surface. It may be limited to one area or there may be several foci of degeneration. Hyaline degeneration and necrosis are often noted side by side in the same tumor.

While some authorities class suppuration among the degenerative changes of uterine fibroids, the classification can hardly be said to be accurate if by suppuration is meant the invasion of the tumor by pyogenic organisms of sufficient virulence to produce the abscess. The confusion of terms may be due to the fact that, in many reports, suppuration is taken more or less for granted without a histologic or bacteriologic study and, also, to the frequent association of gangrenous degeneration and abscess formation.

Infection of a uterine fibroid is most likely to take place during active sexual life. Sometimes years elapse before suppuration sets in after the first symptoms of tumor formation are apparent. Impaired circulation, which activates the bacteria latent in the tumor, causes the infection. Other factors leading to infection of a fibroid are pregnancy, trauma from a surgical or obstetrical precedure, or in the interstitial variety, by direct extension of infection from an endometritis, torsion of the pedicle, chemical irritation, or mechanical irritation.

There is no type of organism peculiar to suppurative myomata. This has been revealed by bacteriologic studies.

The time elapsing between the first signs of fibroid and the development of the infection indicates that the process is evidently not sudden. There may be a rapid increase in the size of the tumor accompanied by local tenderness, possibly by a discharge of pus from the vagina together with emaciation, and signs of a general septicemia. In connection with these symptoms a high leucocyte count should suggest a suppurating tumor since it is well known that leucocytosis is not a feature of the ordinary myoma uteri.

With the advent of suppuration the symptoms may undergo a marked change. Instead of the usual dull dragging pain, there is a sticking or lancinating pain in the lower abdomen. The patient may have chills and fever at times accompanied with night sweats. One of the more important late symptoms is the sallow color. This differs entirely from the pallor that is so frequently noted where there has been great and prolonged loss of blood from submucous myomata. The patient grows progressively weak if septic absorption has taken place and the tumor seems, at times, to diminish in size. Renal changes take place and albumin and casts appear in the urine. If the suppurating tumor opens into the uterine cavity there is a profuse foul-smelling vaginal discharge.

The prognosis is grave. If the tumor is small, nonadherent, and can be removed without danger of rupture and the spread of its contents, the prognosis is much more favorable; although these cases, like cases of cancer, are usually in a state of lowered vitality from toxemia or toxic absorption.

In case a pregnancy is complicated by a myoma, it is important to lay more than usual stress on aseptic precautions during pregnancy, parturition and during the puerperium; and to remove the fibroid as soon after the termination of pregnancy as feasible.

The cause of suppuration in uterine myomata is not always clear. In the majority of cases hyaline degeneration is also present, probably, due to a diminished blood supply. In many cases infection from the intestine has been thought to be the cause, especially where there have been intimate adhesions to the intestine. Kelley and Cullen report two such cases in which this was evidently true.

Infection easily takes place in interstitial myomata that impinge on the uterine cavity, when there is a focal necrosis or hyaline degeneration in those portions near the uterine cavity, and an infective agent in the uterine mucosa. Suppuration in a myoma must not be confused with the cases showing the presence of tubo-ovarian abscesses and, as a result, secondary and encysted abscesses developed in spaces between contiguous myomata. Here the suppurative process is con-

fined, almost entirely, to the outer surfaces of the tumors and not to their interiors.

Hyaline degeneration in a fibroid very often simulates abscess formation so closely that it is impossible to render an absolute diagnosis without making sections. In simple hyaline degeneration no nuclei are present. If abscess formation has taken place, the characteristic polymorphonuclear leucocytes are in evidence.

Too much emphasis cannot be laid on the importance of early surgical interference in the treatment of suppurating myomatas, especially before complications have a chance to develop. The patient's resistance is naturally much reduced from toxemia. The pulse, just before operation, may be very rapid as is so often the case when pus is present. Supravaginal hysterectomy should be performed just as soon as feasible. The patient does not improve by delay; but on the other hand, grows steadily worse. The purulent process in these cases is usually active and the consequent dangers of infection are great.

Suppuration of myomata, as shown by statistics, is rare and yet I cannot but feel that, if every tumor removed in every hospital were cut open and examined, we would find it much more common than we think. A review of the myomata of the uterus operated on at the Woman's Hospital in New York for the year 1918, and reported by Le Roy Broun, comprising 262 cases, showed but one case of suppuration with pus cells infiltrating the tumor tissue. Necrotic changes, however, occurred in seven cases. In the wide experience of Deaver in the Lankenau Hospital, Philadelphia, in a series of 1200 cases, but one case of suppuration was encountered. In my own experience of several hundred hysterectomies for myomatous uteri, there have been four cases of suppuration. With this evidence of the infrequency of this complication, a report of some of the cases may be of interest.

CASE 1.—Mrs. J. C. W., age thirty-four, entered the hospital April 9, 1921. Complained of a sharp pain in the lower abdomen. She had noticed a mass in the abdomen for the past two years, which had increased in size but had not given her any serious trouble, until about two weeks ago. There was a rise in temperature and night sweats several days before she applied for relief. Her menstrual history was normal. She had an irritating leucorrhea and burning on urination.

The patient was well nourished, and slightly delirious with a hot dry skin. There was a nodular movable mass in the lower abdomen which did not fluctuate. The cervix was normal, but the pelvis was filled with a tender hard mass. Urine negative. Blood count revealed a leucocytosis of 21,300. Wassermann was negative.

On opening the abdomen a nodular mass at the fundus of the uterus, about the size of a grape fruit, with other smaller tumors to which the omentum was adherent, presented itself. The tubes and ovaries were normal. A subtotal hysterectomy was performed. One of the nodules was softer than the others and on section showed an irregular pocketed pus cavity filled with greenish pus. Bacteriologic examination showed many pus cells a few gram-negative and intracellular diplococci. The other nodules were of the usual fibroid type and showed no degeneration. The walls of the abscess cavities were lined with partially necrotic

fibrous tissue, richly infiltrated with pus cells. The patient made an uninterrupted recovery.

CASE 2.—Mrs. A. M., colored female, age fifty-three, weight about 220 lbs., has an umbilical hernia and says that her abdomen began to enlarge about fourteen years ago. She always had profuse menstruation lasting about five days, but has passed the menopause five years ago. She had an unpleasant leucorrhea. Had no children or miscarriages.

At operation a large mass of fibroid nodules, which weighed fifteen pounds, was removed. The ovaries were enlarged and the tubes much lengthened. There were numerous old adhesions of an inflammatory nature. The mass was removed by hysterectomy. One of the large nodules, which did not seem as hard as the rest, showed on section many ragged cavities filled with pus. These cavities penetrated the tumor mass to distances of from five to seven centimeters and burrowed their way irregularly in all directions.

CASE 3.—E. D. Well developed colored woman of thirty-six years of age, weighing 140 lbs. There is nothing significant in her history except that of menstruation. Her periods were not painful, but profuse and lasted six days. On examination the whole pelvis was filled with nodular masses of all sizes and immovable. When the abdomen was opened, everything was found to be agglutinated, together with inflammatory adhesions due to successive attacks of peritonitis. The appendix was bound down by sheets of adhesions. A subtotal hysterectomy was done with difficulty on account of the complications. Two of the masses were found, on section, to be suppurating and the conditions were similar to the other cases. Both of these cases recovered.

CASE 4.—A mulatto woman of about fifty-five years, very septic, with daily evening rise of temperature and sweats, entered the hospital. She had a large abdominal mass reaching above the umbilicus. On opening her abdomen the mass was found to be adherent to the whole anterior abdominal wall, and to practically everything else in the abdominal cavity. The adhesions were most extensive. The omentum was adherent over the tumor mass. Large omental blood vessels passed from the omentum straight into the tumor, giving it an adventitious blood supply. Some of these vessels were as large as an ordinary lead pencil. Ligation had to be carried out with great care in order not to tear into the friable structures and produce severe hemorrhage. The mass was finally freed from its innumerable adhesions, but anywhere on its surface if the finger were pressed against the tumor it sank into a softened mass of tissue which was a perfect honeycomb of pus that exuded from everywhere. A hysterectomy was accomplished with difficulty. Needless to say the patient, who was very toxic to start with, succumbed from septic infection in about three days.

DISCUSSION

DR. O. H. SCHWARZ, ST. LOUIS, MO.—Dr. Darnall has not called attention to the type which has generally been called red degeneration, of which, therefore, I desire to demonstrate two specimens. In the gross they were identical in appearance. The one specimen was fixed in formalin and the other in Kaiserling; therefore, at present they present a somewhat different color. On microscopic examination, one tumor hardly differs from ordinary myoma and no hyaline change is evident. The other specimen shows a very marked hyaline change, infiltration of polymorphonuclear leucocytes and many vessels containing much blood. This blood is not laked, nor was I able to find any extravasation between the muscle bundles.

One is a subperitoneal tumor which shows the red color very beautifully. This tumor had part of the omentum still attached and showed a good deal of hyaline

change, leucocyte infiltration and distention of blood vessels. The other tumor was presented to me by Dr. Lee Dorsett and although identical in appearance to the specimen which showed considerable microscopic changes, this specimen microscopically gave the appearance of normal unchanged myomatous tissue.

I have also another specimen of a very unusual suppurating submucous tumor. The patient from whom the tumor was removed was perfectly well until about four or five weeks before admission to the hospital. From the menstrual history there was no evidence of disturbance. On vaginal examination by her physician, he found an enlarged uterus with a large mass in the cervix, the cervix entirely covering the mass. Three weeks before admission to the hospital she developed a marked purulent discharge, with a temperature of 101° F. Three days before admission her physician made another examination and found a mass the "size of an orange" in her vagina. Following this examination there was a sudden gush of markedly purulent material and the mass was found to be protruding from the vagina. She was brought to the hospital and a pedicle was found attached to the upper and left portion of the uterine wall. She was to be operated on the following morning but the night before she suddenly developed air hunger and died. At autopsy the tumor was the only finding except a large thrombus in the right pulmonary artery. It is interesting to compare this case with one described by Cullen.

In Cullen's case the twisted sac of the suppurating tumor was three feet long. The patient was operated on. I do not remember whether the uterus was removed from below or above, but the patient made an uneventful recovery and was ready to be discharged from the hospital, when one day she suddenly fell to the floor and died. Cause of death in this case also was pulmonary thrombosis.

DR. JOHN M. BELL, DETROIT, MICHIGAN.—I would like to add a word of warning regarding the question of leucocytosis as determining the operability of these cases in pregnancy complicating myomata. Here there is normally a moderate leucocytosis and if we depended upon that to determine operability we might be led astray.

DR. DARNALL, (closing).—I think Dr. Bell misunderstood that particular statement. Leucocytosis was not stated to be a criterion for operation but simply a point in diagnosis.

The cases reported by Dr. Otto Schwarz are out of the scope of the paper. The paper definitely exclued, in the first paragraph, the submucous tumors and stated further on that suppurating myomata were often associated with the so-called red degeneration. It has been thought by some that the hyalin degeneration is perhaps the first stage of suppuration and, that eventually the hyalin degeneration will go on to the definitely suppurating tumor.

URETERAL OBSTRUCTION

The Failure to Recognize Ureteral Obstruction a Frequent Cause of Unnecessary Operations

By K. I. Sanes, M.D., F.A.C.S., Pittsburgh, Pa.

BEFORE taking up the subject of the paper let me describe briefly the anatomy of the ureter and the etiological factors of ureteral obstruction.

The ureter is an extraperitoneal organ. Its walls are thin and collapsed when empty; but, under pressure, are capable of great dilatation. It is loosely connected with the underlying structures, especially, in its abdominal portion. At the brim of the pelvis the ureter lies directly on bone, while above and below the brim it is in contact with soft structures. It has three constricted areas. The first and most constricted one is at about the ureteropelvic juncture, accentuated by the renal fascia passing over it; the second, the least constricted area, is at the pelvic brim, and the third at the ureterovesical juncture. The nerve supply of the ureter is derived from the renal, mesenteric, spermatic and hypogastric plexuses, which supply the intestinal and the greater part of the genitourinary tracts.

In its course from the pelvis to the bladder the ureter lies in close contact with organs which not uncommonly are the seat of operable pathology. At its beginning the right ureter is covered by the third portion of the duodenum. The abdominal portions of ureters are situated immediately to the inner side of the colon. At the pelvic brim, on the right, the ureter lies just to the inner side of the base of the appendix, and, not infrequently, is crossed by it; on the left, the ureter is crossed by the first portion of the rectum. The pelvic portion of the ureter in the female, lies posteriorly to the ovary and, on its way to the bladder, passes through the base of the broad ligament to the side and front of the cervix and vagina; in the male, it is crossed by the vas deferens and enters the bladder immediately in front of the seminal vesicle.

ETIOLOGIC FACTORS OF OBSTRUCTION AND THEIR RESULTING PATHOLOGIC CHANGES

Not uncommonly obstructed areas are found along the course of the ureter. They are of different types, and are caused by various etiologic factors. The causes may be extraureteral, including constricting bands, cicatrices, and sclerosed cellular tissue, which may either result from operative procedures or follow such inflammatory processes as

tubo-ovarian, appendiceal, parametritic, colonic (diverticulitis), etc. Here belong also uterine, broad ligament and ovarian tumors, pregnant uteri, scoliosis, anomalous blood vessels, etc. Obstructing causes may be intraureteral. Such are the impacted calculi, blood clots, and pus plugs, congenital stenosis, strictures from ureteral ulceration, etc. An obstruction may also be the result of such irregularities in the course of the ureter as kinks, angulations, and high insertion into the pelvis.

These various etiologic factors give rise to many pathologic changes in the urinary tract. In a general way, we may say that a normal ureter, obstructed by any of the causes mentioned, becomes dilated above the site of constriction, the degree of dilatation depending upon the length of time and the extent of the obstruction. If the obstruction is bad and lasting, the dilated ureter may become elongated and kinked, the kidney may become hydronephrotic, and, if infection supervenes, there may develop a pyoureterosis and pyonephrosis.

If an obstruction takes place in an inflamed ureter, the character and extent of its pathologic changes will depend greatly on the origin, nature and severity of the preceding inflammation, i.e., whether the inflammation was ascending or descending; extra or intraureteral; tubercular or nontubercular; acute or chronic; ulcerative or nonulcerative. In any case, however, in the inflamed obstructed ureter the destructive changes are much greater and pyoureteronephrosis more common than in the obstructed ureters without a preceding inflammation.

We see from the above that the ureter lies in close proximity to organs which are frequently the seat of surgical lesions, and that the etiologic factors of ureteral obstruction and the pathologic changes they induce are various and complicated. Before we discuss the causative influence of these facts on our frequent failure to recognize and properly treat ureteral obstruction, I will cite three cases that came under my observation recently.

CASES OF URETERAL OBSTRUCTION MISDIAGNOSED AND UNNECESSARILY OPERATED UPON

CASE 1.—Miss B., age twenty-one, Western Pennsylvania Hospital, No. 1729. History, upon admission Aug. 10, 1920, as follows: For the last five years the patient has been subject to attacks of pain in the right lumbar region, radiating to the front of the abdomen and bladder. No urinary disturbances accompanied the attacks. For these complaints an appendectomy was performed three and one-half years ago. As the attacks recurred, she was operated upon eight months later, the stump of the appendix was removed and an operation for a Lane's kink was done. No relief followed the second operation, and a year later the patient was subjected to a third operation; this time for obstructing adhesions. As this also failed to give relief, a fourth operation for adhesions was performed a year ago. The data obtained from the history suggested an investigation of the

urinary tract. Repeated explorations of the right ureter showed an obstruction four cm. above the right ureteral meatus, which was finally passed. The urine obtained from the right kidney showed a few leucocytes; otherwise it was normal. A pyeloureterogram was taken, which demonstrated a dilatation of the ureter above the site of obstruction. A diagnosis of stricture of the ureter was made.

CASE 2.—Mrs. B., age 25, Western Pennsylvania Hospital. No. 4694. She was admitted to the hospital Dec. 4, 1919, with the following history. For nine years she has been suffering from a constant dull pain in the right lumbar region, with frequent acute exacerbations requiring morphine. The pains when severe, radiated to the right iliac fossa and down the thigh. She had frequency, nocturia, and, at times, hematuria. For this, six years ago, an appendectomy and a right salpingooophorectomy were performed. No improvement followed. An x-ray examination three years ago showed a right-sided renal shadow, and an operation for nephrolithiasis was undertaken. No stone, however, was found, but a renal cyst was incised. Her condition remained unchanged except for the added chills and fever. Upon admission the urine showed pus; but the cystoscope revealed no pathology in the bladder. Repeated catheterization of the right ureter demonstrated an obstruction about 10 cm. above the ureteral ostium, which was finally passed. The specimen of urine obtained from the ureter was loaded with pus. A ureteropyelogram showed a dilated, kinked ureter with a large renal pelvis and obliterated major and minor calices. A diagnosis of a right ureteral kink with a pyonephrosis was made.

CASE 3.—Mrs. S., age 28, Western Pennsylvania Hospital, No. 7603. After the delivery of her first child, six years ago, patient developed a backache, worse on the right side. During her next pregnancy, four years later, the backache somewhat improved, but after the delivery the symptoms became worse than ever. As the complaint was attributed to a lacerated perineum and cervix, a perineorrhaphy and trachelorrhaphy were performed two and one-half years ago. The pain, however, grew gradually worse. Six months later, in addition to the backache, she developed a pain in the left groin which annoyed her so much that she consented to a second operation. The uterus was fixed and the appendix was removed. No relief followed; in fact, her symptoms became worse. Chills and fever began to accompany the attacks of right lumbar pain.

She was admitted to the hospital May 1, 1917. Her urine was found to contain many red and white blood cells. Upon catheterization of her right ureter, its upper third was found blocked. Repeated attempts to pass the obstruction failed. A specimen of urine from the right kidney showed pus. An x-ray plate of the right urinary tract demonstrated a stone at the tip of the catheter and a ureteropyelogram showed the ureter dilated below the obstruction. No opaque fluid was found above the stone. A right ureteronephrectomy, May 28, 1917, confirmed the diagnosis of an obstructing ureteral calculus with pyonephrosis.

CAUSES OF DIAGNOSTIC ERRORS IN URETERAL OBSTRUCTION

The anatomic relations of the ureter and the complicated pathology of the obstructed ureter, described above, explain, to a great extent, our frequent failures to recognize and interpret disturbances of ureteral origin. Not infrequently symptoms, that are due exclusively to lesions in the ureter, are ascribed to that of the adjoining organs; and, when pathology in the ureter and its adjacent organs coexists, the symptoms resulting from such combined pathology are attributed

entirely to the neighboring organs, and the ureter is ignored in the diagnostic consideration. Sometimes, even after the surgical removal of adjacent organs, the ureteral disturbances that persist after the operation are attributed to postoperative adhesions for which surgical procedures are recommended and carried out.

Of all the abdominal organs, the appendix, in our observation, is most commonly involved in such diagnostic errors. As we mentioned above, the ureter, at its second constricted area, is situated immediately to the inner side of the appendix, and, in some cases is crossed by it. One can easily see how, for instance, an acute right-sided ureteral pain from an impaction of a calculus in this constricted area may be interpreted as an appendiceal pain; how a ureteral inflammation, resulting from extention of an appendiceal inflammatory process, may be overlooked, and how the symptoms of ureteritis or ureteral strictures secondary to an appendectomy may be ascribed to postoperative abdominal adhesions.

The pelvic organs in the female are next in frequency involved in such diagnostic errors. The intimate relation of the ureter to the pelvic organs and the not uncommon exacerbation of ureteral disturbances during menstrual periods lead us, when not sufficiently on guard, to interpret ureteral obstructive symptoms as those produced by the pelvic organs, to ignore them when they are secondary to pelvic pathology, and to ascribe them in postoperative cases to pelvic adhesions. For similar reasons disturbances caused by ureteral obstruction are incorrectly attributed to pathology of the rectum, colon, ileum, seminal vesicles, etc.

INDICATIONS FOR INVESTIGATION OF THE URINARY TRACT IN CAREFULLY TAKEN HISTORIES

Cases of ureteral obstruction always give in their clinical histories, if carefully taken, data indicating pathology in the urinary tract. With the great varieties of location, etiological factors, structure, and complications of ureteral obstruction, one cannot expect to obtain symptoms sufficiently characteristic, as to make a definite diagnosis; but a good history almost always gives data that suggest the investigation of the urinary tract, which usually lead to such diagnosis. These data include:

1. Continuous ache or pain localized at some definite part of the urinary tract, the order of frequency of such locations being the kidney, bladder, and ureter.

2. Intermittent attacks of severe pain in lumbar or ureteral region with radiations, usually, downward toward the bladder and thigh, and, occasionally, upward toward the kidney, such attacks being frequently accompanied by gastric disturbances, chills and fever.

3. Urinary disturbances such as frequency, dysuria, and urgency (amounting at times to incontinence), which may be continuous or occur only during the intermittent acute attacks, the most common of these disturbances being frequency of urination.

With such a history a urinalysis (in females, of a catheterized specimen) should be made; but while the presence of pus or blood in the urine, especially if it is known to be intermittent, is of unquestionable diagnostic value, negative findings can by no means exclude ureteral pathology.

If the data obtained so far suggest an investigation of the urinary tract, a physical examination of the kidney and ureter should be made first. By first percussion over the lumbar region and by bimanual pressure over the lumbar and hypochondriac regions we look for renal tenderness. At the ureteropelvic junction and at the brim of the pelvis by pressure and palpation, we try to make out the tender, dilated ureter if such be present. By vaginal we can examine the lower third of the ureter. This last examination is of particular importance, for by it the terminal three inches of a pathological ureter can be felt as a cord-like, tender tube along the anterior and lateral fornices of the vagina as it runs backward, upward, and outward to the pelvic wall. As a part of the physical investigation an examination of the pelvic organs and the appendix should be made on account of their anatomic relationship to the ureter and the influence of their pathology on ureteral obstruction.

METHODS OF INVESTIGATION OF URETERAL OBSTRUCTION AND THEIR RELATIVE IMPORTANCE

The patient is cystoscoped and a careful inspection of the ureteral orifices is made. We may find the cause of the obstruction right at the ureteral meatus, may see a stone presenting at the orifice, or an edematous and inflamed meatus, suggestive of a calculus, immediately above it. We may notice a stenosed, prolapsed, dilated, or ulcerated ostium; we may find the meatus obstructed by a papillomatous growth or, in bad cystocele cases, by extensive folds of the mucous membrane.

After careful cystoscopic inspection of the orifice, an opaque graduated catheter is introduced as far as possible into the suspected ureter, preceded, if required, by ureteral meatotomy for stenosis. A specimen of the kidney urine is then obtained for culture, chemical and microscopic analysis, and, if tuberculosis is suspected, guinea pig inoculation.

Whether the catheter is passed up into the kidney or, on repeated attempts, is stopped at a definite point below it, the question of absence or presence of obstruction is not definitely settled. Such obstructing factors as calculi, angulations, or constrictions from external pressure, may be present; and yet the catheter may pass up into

the kidney. Even bad cicatricial strictures resulting from ulcerations may, at periods of greater patency, permit the passage of a catheter. On the other hand, in the absence of obstruction in the ureter, the catheter may be prevented from going up into the kidney if caught in a small diverticulum, valve, or in the wall of a somewhat dilated and freely movable ureter. In certain conditions, however, the catheter does give us very suggestive information, A "hang" during the withdrawal of a catheter speaks in favor of a stricture; a rapid collection through the catheter, with the aid of a syringe, of more than 15-20 c.c. of urine, suggests a hydro- or pyonephrosis; and the finding of scratch marks on a waxed tipped catheter used for ureteral examination diagnoses a calculus. If an x-ray picture is taken with the catheter in position, the catheter shadow may also demonstrate the location and size of the stone.

The most valuable aid, however, in the diagnosis of ureteral obstruction is given by ureteropyelograms. The opaque fluid injected into the ureter and renal pelvis gives us x-ray shadows which, if properly interpreted, supply us with valuable information that cannot be obtained by any other means. It shows such cases of ureteral obstruction as kinks, strictures, etc.; it demonstrates constrictions resulting from extraureteral pathology; it discovers such diagnostically difficult conditions as obstruction by an anomalous renal vessel; it distinguishes the simple inflammatory stricture from tubercular and both from noninflammatory obstruction; it proves definitely the presence of the obstruction by demonstrating the dilatation of the ureter and pelvis above it; it gives quite a definite idea about the extent of pathologic changes, and, not infrequently, about the prognosis and treatment of ureteral obstruction. True, ureteropyelography entails some technical difficulties and, if not carefully done, is liable to cause pain and injury to the patient; but this applies just as well to many other diagnostic and therapeutic procedures. In our judgment a great deal of these difficulties may be avoided if we use smaller catheters, inject smaller quantities of opaque fluid, and drain away the fluid through the catheter after taking the ureteropyelograms. This has been our experience in several thousand pyelograms.

I have called attention in this paper to the frequent failures to diagnose ureteral obstruction, gave as reasons for them the anatomic relationships of the ureter and the great variety of obstructive factors; I brought out the point that good histories and careful physical examinations could be relied upon to give us the indications for investigation of the urinary tract; and, finally, discussed the diagnostic value of cystoscopy, ureteral catheterization, and ureteropyelograms in the cases of ureteral obstruction.

If the studies suggested above were conducted in doubtful urological

cases, many a patient could have been saved the trouble of unnecessary treatment or operative procedures, and could have their pathologic lesion corrected before it became irreparable. The unfortunate results of the neglect of such investigations are seen in almost every clinic. Attention of the profession, especially the surgical, should be called to it. True, such investigations require a great deal of effort. It demands a carefully taken history, a complete urinalysis, an examination of the abdominal and pelvic organs, a cystoscopic examination, a catheterization of one or both kidneys, an x-ray study of the urinary tract; and, not infrequently, of such abdominal organs as gall bladder, colon, stomach and duodenum. Such a study is time consuming, expensive, and requires a close cooperation of well organized cystoscopic, pathological and roentgenologic departments. All this is true, but let us not use such arguments against diagnostic methods of procedure that are intended to save many lives and much unnecessary suffering.

DISCUSSION

DR. JOHN O. POLAK, BROOKLYN, NEW YORK.—The paper of Dr. Sanes brings out something of considerable interest to the gynecologist. All of us who are operating in teaching hospitals find great numbers of these surgical derelicts who have been operated two, three, or four times for appendicitis, adhesions and the like; and we have learned that the department of gynecology must include a department of urology in order to make the diagnosis in these pelvic cases, for the reason that most of the cases give a history of starting during pregnancy or after labor. All of us know that there is considerable trauma during labor and that parametritis is much more frequent than any one supposes unless one is making examinations in a postpartum clinic. When one opens the abdomen and finds the pelvic veins obstructed and the ovaries adherent in every case where a parametritis has been present, one can see how this same scar tissue can constrict a ureter and produce sufficient stasis in the ureter to cause intermittent hydroureter. A great many of these cases, as the doctor said, have these strictures. They are more frequent than stones and cause intermittent hydroureter and hydronephrosis.

DR. E. GUSTAV ZINKE, CINCINNATI, OHIO.—How do you differentiate between a shadow that represents a stone and a shadow that is created by some other body not in the ureter, perhaps beneath it, above it or to one side of it?

DR. SANES, (closing).—Dr Polak's remarks are correct. We have frequently found these patients giving a history of preceding pelvic inflammation. An inflammation of the pelvic organs may, by extension, affect the periureteral and ureteral tissues, causing constriction and ureteritis. Dr. Zinke's question I think is answered in the paper. One of the slides showed a shadow of a calcareous substance outside the ureter, demonstrating the x-ray catheter. If we find a shadow outside of the ureter we know that it is not caused by a stone. We do not diagnose a stone unless it is in the ureter, in immediate contact with the ureteral x-ray catheter.

THE INDICATIONS FOR AND THE DANGERS IN THE USE OF SPINAL ANESTHESIA IN OBSTETRICS, GYNECOLOGY, AND ABDOMINAL SURGERY

By R. R. Huggins, M.D., F.A.C.S., Pittsburgh, Pa.

TWENTY-TWO years ago Bier, of Kiel, developed the technic of spinal anesthesia and demonstrated its value as an aid in surgical procedures upon the lower extremities. It was at once popularized by Tuffier who extended its application to operations upon the pelvic and abdominal organs. During this time it has been used with various degrees of satisfaction by surgeons all over the world. Some are enthusiastic about it, others denounce it in no uncertain terms. A study of the literature shows that the indications and contraindications are not clearly understood. Even those who are most enthusiastic have not made clear exactly why it is to be preferred to other methods of anesthesia under certain circumstances; nor has an earnest effort been made to educate the profession as to its advantages or dangers. That its use has slowly grown more popular and that those who have taken the trouble to develop a reliable technic and who have a healthy respect for its dangers still continue to use it, would suggest that it has earned a permanent place among anesthesia procedures.

When a new therapeutic or a new surgical procedure is discovered we are very prone to expect the unusual and sometimes the impossible. For this reason they are used as a last resort after all other means have been employed with failure or given without knowledge either of their true indication or physiologic action. If one attempts the use of spinal anesthesia only when some other anesthetic is contraindicated, unless he has had a good experience with it, he may be greatly disappointed and the experiment may be accompanied by disastrous results. We believe that no anesthetic has yet been discovered that is free from mortality either immediate or remote. A certain number of deaths occur suddenly on the table from all forms of inhalation anesthesia, whether it be ether or nitrous oxide. The percentage of deaths depends upon the skill of both the anesthetist and the operator. That there is a mortality and morbidity with which all forms of inhalation anesthesia have much to do, which occurs after the patient leaves the operating room is equally true. There is an interval here that still needs much study and careful observation in order to determine how the credit must be shared between the shock and exhaustion incident to the anesthetic and that due to the surgical pro-

cedure minus the event of anesthesia, in patients who die from so-called exhaustion and shock within two or three days after an operation. Here lies one of the main points in the indication for spinal anesthesia in selected cases, and in a comparison of the dangers of its use this must not be overlooked. That death does not occur for forty-eight hours after operation in no way absolves a certain responsibility for any form of inhalation anesthesia.

The stimulating action of ether in the first half hour of anesthesia is readily observed in the flushed face, the rapid respirations, the increased pulse rate and the hot, moist skin. In patients who take the anesthetic badly, there is in addition, the suffused cyanotic skin of the face, the engorged veins, the stiff muscles and the forced respirations due to increased mucus, laryngeal spasm or obstruction as a result of falling back of the tongue, so that ether anesthesia produces a condition of activation and stimulation at first, which is followed later by the exhaustion which is certain to follow long continued overactivity. The later stages of prolonged anesthesia are characterized by lowered temperature, absence of the flushed skin of the early stages, skin drenched with perspiration, respirations that are shallow, and evidence of exhaustion. Many patients are not sufficiently supplied with a reserve force of energy to withstand an hour or two of such activation without exhaustion. Add to these effects of the anesthetic *per se*, the increased trauma on the part of the surgeon in overcoming the tense abdominal muscles, the tendency of the patient's respiratory movements to extrude the intestines through the incision, the increased amount of hemorrhage as a result of the stimulation, the overventilation of the lungs due to rapid breathing, the loss of fluid from sweating and postoperative vomiting, and we have the elements that contribute to shock. It is readily apparent that the increased heart action incident to the stimulation and rapid breathing during the stage of excitement leads to cardiac exhaustion and in a patient with a weak cardiac muscle the result is the same as it would be under forced exercise.

In spinal anesthesia, the blood pressure falls, the respirations become slow, the pulse rate is reduced, the heart is working slowly as a result of the lowered blood pressure against less peripheral resistance and the skin remains dry and warm. In no possible way could the heart be given a better rest for a certain definite period. If the patient has been properly prepared by the previous administration of scopolamine and morphine, she comes to the operating room indifferent and oblivious to her surroundings. There is no psychic trauma and consequently no expenditure of nervous energy. A patient with the combined "Daemmerschlaf" and spinal anesthesia presents the appearance of one in hypnotic sleep, so that after an operation of one

and one-half hours with all bodily activities subnormal and all traumatic impulses blocked, the patient has expended less energy than under normal conditions. In addition, there is perfect relaxation of the abdominal muscles and the contracted intestines lie quietly in the abdominal cavity. As a result of the low blood pressure, bleeding and troublesome oozing is much less. The conservation of energy that may be applied and which is often needed in the stress of postoperative recovery, the good condition of the patients after extensive severe operations, the lessened postoperative shock and discomfort with rapid recovery of strength, are all factors that lead to enthusiasm in the interested observer. It is by such a method that shock is reduced to the minimum and in our experience it has not only resulted in a lower mortality in certain cases, but it has led to a more rapid recovery with lower morbidity.

With the above important facts in evidence, certain groups of cases are at once suggested where spinal anesthesia is especially indicated. They include severe pelvic infections with dense adhesions, where the removal of the diseased structures is accompanied by profuse bleeding and an unusual degree of shock, and in fibroid tumors where the heart and entire musculature is weakened as a result of toxemia and hemorrhage. A similar condition is found in chronic gall bladder infections. In such patients there is usually a weakened heart muscle and often the general condition is much below par as a result of the infection and associated toxemia. In obesity accompanied by fatty degeneration of the heart muscle and where operation is often followed by pneumonia; in the early stages of an acute spreading peritonitis before the patient becomes saturated with the toxins of infection; the mortality of such a series of cases is still sufficiently high in every clinic to cause concern, and it is here that we have derived the greatest benefit from spinal anesthesia. That we have been able to operate safely many cases which die under the use of ether, leads to our enthusiasm and earnest effort to bring out if possible the advantages and dangers of this method, and lend what aid we can in placing it upon a safe and sound basis. It is in the above class of patients, the majority of whom are young or in middle life that should be operated without mortality. The heart muscle temporarily weakened from infection will entirely recover its normal if the cause is removed. It is definitely indicated in pulmonary tuberculosis and asthma.

It is dangerous where there are permanent changes in the arterial system which interfere with the normal elasticity of the vessels. It has been repeatedly stated that it is contraindicated after the age of sixty-five. It is dangerous here because of the drop in blood pressure in arteries which do not have the power to adapt themselves to the

changed condition on account of their inelasticity. It is not a matter of age. This may happen in one much younger if there is marked disturbance of the arterial tone, and on the other hand it can be given to a person much over sixty-five if the walls of the arteries are healthy. For this reason we avoid its use in patients with a high blood pressure, and where there are signs of the above mentioned arterial changes. For this same reason we avoid its use in patients who have an extremely low blood pressure. A blood pressure of eighty-five or ninety usually indicates a low vital resistance and it may be uncertain how much fall in blood pressure the patient may safely withstand. We must constantly bear in mind that surgery is contraindicated in some patients on account of the low vital resistance and that no form of anesthesia can be given without risk. We believe that a careful study of the arterial system together with a knowledge of the vital resistance is an important element in the successful use of spinal anesthesia because it is here the danger lies rather than in a sudden effect upon the respiratory center. With our present method, there seems little danger from this standpoint. We have avoided its use in patients desperately sick such as in general peritonitis and those in severe shock. The experience of those who used it during the late war would indicate that results were better in a comparative way than in other forms of anesthesia. Patients who are psychopathic or extremely nervous should not be given spinal anesthesia. Where there is a history of chronic headache its use is contraindicated for the reason that the patient may get the idea that this symptom has been aggravated. In syphilis especially when it in any way involves the nervous system spinal anesthesia should not be used because all symptoms which follow the operation are usually attributed to the operation and no doubt, in cases where paralysis of various forms have been reported following this method of anesthesia, careful study would have revealed syphilis as a cause instead of the anesthetic. We have made every effort to prevent accidents because we believe no unnecessary prejudice should be established against a method of such great value if given properly and with due regard for its dangers.

Spinal anesthesia is not free from danger, neither is any other anesthetic, even the simplest if not given with intelligence. It requires the greatest care always with attention to detail which includes careful study of the patient before its administration and constant attention by some one who is trained to observe the patient throughout the period of anesthesia. Unless, one is willing to subscribe to all these details, after having acquired a working knowledge of the method he should never be responsible for its administration. We have used it with the above principles in mind over a period of years. We believe that it is a special method which will eventually become part

of our armamentarium and will be used under special indications. It is folly to use it generally or to expect it to succeed when there are certain definite contraindications to its use or as a last resort. Surely we have reached the place where it is well known that we have no anesthetic which can be applied indiscriminately and that will meet all requirements. Many charts might be exhibited showing the marked difference in the reaction of the pulse and temperature following this method as compared with inhalation anesthesia. This would consume time and fill valuable space and after all would in no way convince any one who may be skeptical. This is all strikingly demonstrated at the bedside. In our last 1000 major gynecological operations exclusive of five deaths of peritonitis which were caused by imperfect sterilization, in one instance contaminated water, in another improperly prepared gloves, our mortality has been seven-tenths of one per cent. This included many bad risks, some of whom could not possibly have been operated safely by any other method. We are pleased with the result and feel that our mortality has been distinctly lowered.

We have had two fatalities in a series of 1500 cases. The first occurred in a case of eclampsia in a primipara with contracted pelvis where cesarean section was necessary. The patient had several convulsions before the operation and was seized with a convulsion almost immediately after the anesthetic was introduced. Death occurred suddenly from cessation of respiration in spite of all efforts of resuscitation. While the condition of the patient was not good and there may be a possibility that she died from the convulsion, I have no doubt that the death was due to the sudden change in the spinal fluid which carried the anesthetic immediately up the canal to the medulla. Little is known about the spinal fluid at best, but that it is greatly disturbed in the paroxysm of a severe eclamptic convulsion is undoubtedly true. I would say that spinal anesthesia is definitely contraindicated in the presence of any form of convulsions. The second case was a patient who had been ill for ten weeks with a severe puerperal infection, where operation was undertaken as a last resort and where one would be almost certain of death with any method of procedure. She had a blood pressure of only 80 before blood transfusion which brought it up to 90. It may be recorded as a foolhardy attempt at the impossible. It was interesting from the standpoint of emphasizing the danger where there is low vital resistance with extremely low blood pressure. Before giving the anesthetic, we had placed a cannula in the vein and had given a solution of adrenalin almost immediately. As soon as anesthesia came on, the blood pressure fell and continued to fall without any response to all stimulation. It was a striking example of death from fall in blood pressure in a patient who had no reserve force in the vessel walls upon which to draw in such an emergency.

These deaths in no way change our views about spinal anesthesia. It should never have been given to either of these patients. We learn from mistakes and they should be recorded. It is the only way progress may be attained, but these deaths should not be charged against the method without reference to the condition of the patient at the time of operation. We are entirely satisfied that we have been able to operate upon patients successfully where it would have been impossible under any other form of known anesthesia today, and that our mortality has been materially lowered in the class of cases above mentioned among the indications for its use. We are so thoroughly convinced of this fact that we desire to throw every safeguard about it and offer our experience in such a way that those who may be interested may approach it in a sane manner and without prejudice.

We have always used novocaine because it is the least toxic of all effective local anesthetics. We give 2 c.c. of an 8 to 10 per cent solution in water which has been trebly distilled. To this is added 4 minims of absolute alcohol. The solution is made fresh and boiled just before its introduction. All instruments used are also boiled in distilled water so that all danger of chemical irritation is avoided. We believe it is of the greatest importance to be sure about the technic and all details in order to avoid the danger of infection. If this practice is carefully followed, headaches will seldom occur. This is a sequel often mentioned and given as a criticism of the method. Wherever headaches have occurred, it has been due to some error in technic. At one time a number of headaches in a series of cases caused us to make a thorough examination which revealed the fact that we were using distilled water which was contaminated with some inorganic matter from a defective still. Since that time, we have used a small glass still and this water is always freshly distilled just before use. Some dissolve the novocaine in the spinal fluid. We have hesitated on account of the danger of infection from imperfectly sterilized novocaine. No other untoward symptoms such as local paralysis have been observed. We aim in every way to avoid psychic shock and all mental excitement or disturbance by careful preparation of the patient for anesthesia. Two hours before operation, a hypodermic of scopolamine gr. $\frac{1}{200}$ and morphia gr. $\frac{1}{8}$ is given. Thirty minutes before the scheduled time a second hypodermic of morphia gr. $\frac{1}{8}$ is administered. The patient is then brought to the operating room in a comfortable sleepy condition which renders even the most nervous individual free from fear and excitement. Ears are plugged with cotton and the eyes blind-folded and all unnecessary talk and noise forbidden in the operating room. With the additional fall in blood pressure, the patient often goes to sleep and does not regain interest in her surroundings until the operation is ended. All "grandstand" performance such as allowing patients to witness the proceed-

ings, reading, smoking, etc., are not allowed. Before they are sent back to the ward another hypodermic of morphia is given to control the pain, the onset of which is somewhat sudden and may be severe after the effect of the anesthetic passes away. We never place our patients in the Trendelenburg position because we believe it increases the danger. We do not as yet know exactly what may happen in the spinal fluid under all circumstances and I have seen trouble in the hands of other men which I thought was caused by the extreme Trendelenburg position.

CONCLUSIONS

Increased experience leads us to the same conclusions stated in a paper before this Society five years ago. The freedom from nausea, abdominal distention, postoperative weakness and other disturbances so common with other forms of anesthesia recommend it as an improved method for cases when given under proper supervision and with full knowledge of its danger. We believe this method to be worthy of careful consideration on the part of every progressive surgeon who is willing to spend the time and care which are necessary in order to achieve success. Spinal anesthesia is the best anesthetic known today for certain operations in the lower abdomen. It should be given only after careful study of the patient. If it is not properly employed by one possessing sufficient skill, it may have a large mortality. There is no form of anesthesia which is altogether free from danger either immediate or remote. There are well defined contraindications to the use of all anesthetics in certain instances, and the operator must exercise considerable judgment as to which anesthetic should be employed in a given case.

DISCUSSION

DR. GEORGE GELLHORN, ST. LOUIS, MISSOURI.—I want to endorse what Dr. Huggins has said. I believe firmly, as he does, that spinal anesthesia forms one of the most valuable aids to our operative procedures. Have you noticed how inconsistent we are? We preach to the profession and laity about the right of the patient to be considered individually and claim that every case should be treated on its merits, and then we calmly go ahead and carry out our routine. Thus, there are operators who operate on all kinds of patients under ether. They would not change from that habit for anything in the world. Conversely, there are others who do everything under the sun under spinal anesthesia. I am at this point at variance with a well-known surgeon in the east, who advises spinal anesthesia for everything. He does curettages, hysterectomies, and hemorrhoidectomies under spinal anesthesia. That looks to me like training a big cannon on humming birds. Spinal anesthesia must be reserved for major operations. I have used spinal anesthesia for more than eleven years on something like 600 cases, and would not give it up. The absolute contraindications are hypotension and kyphoscoliosis or other deformities. There are also relative contraindications, such as a neuropathic disposition, a tendency to headaches, and skin eruptions at the site of injection. I cannot, however, agree with Dr. Huggins as to hypertension being a contra-

indication. On the contrary, I feel that such cases are eminently well suited for spinal anesthesia. Ether would be most dangerous, whereas in spinal anesthesia, the blood pressure will be reduced immediately. To prevent too rapid a fall of the blood pressure, adrenalin may be injected when the drop becomes manifest.

I regret the fact that our professional anesthetists, as a rule, limit themselves to one or two methods of inhalation narcosis. In order to be true specialists, they should be experts in *every* kind of anesthesia or analgesia used in surgery.

DR. WILLIAM SEAMAN BAINBRIDGE, NEW YORK CITY.—Some years ago, when spinal analgesia was first brought before the profession, I put it to a thorough test, having special opportunity to do so at the New York City Children's Hospital and Schools at Randall's Island and at some other institutions. I employed it in 1600 cases of all kinds under varying conditions, using the method for operations below the clavicle. Many of the patients were poorly developed, undernourished children, and some were cases in which one would hesitate to use any form of anesthesia. The ages ranged from three months up to seventy-five years. The three months old child had a congenital cardiac disorder and a hypostatic pneumonia; it recovered perfectly except for the heart condition, which still remains. An interesting fact of the case is that during the entire operation the child nursed from a bottle.

I believe spinal analgesia has a place in surgery but is not without its dangers and should be very carefully employed.

DR. HUGGINS, (closing).—There have been two methods of preparing the solution, the heavier and the lighter. When alcohol is used it makes the solution lighter than the spinal fluid and we then elevate the head of the bed, thus allowing the fluid to drift toward the base of the column rather than toward the medulla. We have felt that this is more effective, that alcohol slowly introduced gives us a better anesthesia.

One thing in regard to high blood pressure, as brought out by Dr. Gellhorn. I am thoroughly convinced that is where we get into trouble sometimes. A man will give one or two or three hundred spinal anesthesias and then a patient will die suddenly and they will throw the method up. That is what happened in the genitourinary clinics down at Baltimore, they would not give it because some old men died. In such cases the patients should not have been given spinal anesthesia for they had inelastic arteries and they do not withstand the change.

We must be careful about that one thing, and if we are careful about the fundamental principles I think we will keep out of trouble.

NEOPLASIA OF THE KIDNEY

With Reports of Five Primary Cases: 1. Papillary Epithelioma, 2. Hypernephroma, 3. Malignant Teratoma, 4. Squamous Celled Carcinoma, 5. Lymphoblastoma.

By James E. Davis, A.M., M.D., Detroit, Mich.

THERE is no part of the body where developmental complexes are better illustrated than in the urogenital system and the nephridial division is more intricate than the genital. Felix[1] says the kidneys do not have a gradual but rather a saltatory development (the word "saltatory" is derived from the Latin "saltator," a leaper or dancer). Others have used the term "nephridial successions" or "dynasties" in referring to this interesting phase in renal development. It is noteworthy that this rapidly moving divisional change has to fit into a definite period of one entire development and as a part of this accomplishment there occurs not only the formation, but also the disappearance of the entire pronephros and the greater part of the mesonephros. The period of development for the excretory system in most vertebrates reckoning from its formation until its completion, occupies an interval, says Felix,[2] that is long in comparison with that shown by other organs. The pronephros begins to appear in embryos of 1-7 mm., when there are but 9 to 10 primitive segments. All its tubules have developed and the primary excretory duct is nearly complete in 2.5 mm. embryos. At 4.25 mm. the duct has reached the cloaca and fused with it, establishing the outlet for the celom.

This first kidney is both[3] vestigial and rudimentary for it is a disappearing structure, but it is also an appearing imperfect organ. While it is true the pronephros functionates in amphioxus and certain lamphreys, it must be regarded as a very limited excretory organ in an imperfect representation of its species.

It is important for the purposes of this contribution to refer at this time to the relation obtaining between the vestigial-rudimentary kidney and its primary or primitive cell units since the pathology may be postulated or the histogenesis determined for neoplasia from just such premises as may here be laid down.

The considerations are of the facts involved in (1) rapid growth, (2) rapid degeneration, (3) growth and degeneration in the same organ at the same time, with constant conformity to a general body growth impulse, (4) cell and organic immaturity held in abeyance to larger growth impulse, (5) a three phase evolution from dissimilar compo-

nent units. The import of the foregoing is made clear by the briefest review of the morphological development of the first of the two primary kidneys. A description of one adequately answers for both primary organs and also covers the essentials of each in the formation of the metanephros.

In the general course of normal development the blastoderm produces its layered divisions of ectoderm, mesoderm and entoderm providing differentiation, proceeds in the orderly way. From the mesoderm of the intermediate cell mass is derived the nephrotome. But in some animals a differentiation of the germ cells occurs before the blastoderm is formed.[4]

From the nephrotomes seven pairs of rudimentary pronephric tubules are formed as dorsal sprouts. These grow dorsally, also laterally, bending so as to unite and form a long collecting duct from the seventh to the fourteenth segments. The first tubules in the seventh segment degenerate before those of the fourteenth have developed.

The free end of the collecting duct extends in a caudad direction beneath the ectoderm and lateral to the nephrogenic cord until it reaches and perforates the lateral wall of the cloaca.

The higher number of nephridial structures occur only in the amniotes. All three are closely related in development and structure whether they are parts of an original continuous organ[5] (holonephros) extended the length of the body cavity and which has broken into separate parts or are they three separate organs or, are they not strictly homologous but superimposed structures has not yet been decided.

The plan of repeating one part after another (metamerism) is said to have its origin in the mesothelial structures and has been secondarily impressed on other systems. The mesothelial walls dispose their parts in three zones of each coelom—the muscle plate zone (epimere), the lower or lateral-plate zone (hypomere), and between the foregoing plates a middle plate zone (mesomere). All three plates form in the trunk. Constriction or segmentation forms the series of hollow cubes (myotomes) each with a part of the coelom (the myocele) within.

The myotome grows between the ectoderm and the somatic wall of the hypomere. Each myotome has a somatic and a splanchnic wall. From the latter or splanchnic wall there is derived the musculature (from the upper part) and the skeletal tissue (ventral part).

The mesomeral (middle plate) part is largely concerned in the formation of the excretory (nephridial) system and it has both excretory portions and the skeletogenous parts (these are called nephrotomes and sclerotomes, the nephrotome cavities being the nephrocoeles).

The foregoing brief discussion may set forth with some degree of clearness the more important essentials to be considered in relating the vagaries of kidney neoplasia with the histogenetic conditions of its development. The latter has yet many unknown problems for elucidation and this is equally true concerning the neoplastic changes developed in the kidney.

The benign tumors of the kidney are usually small, unimportant, and rare, but neoplastic growths constitute approximately 2 per cent of all malignancies. The difficulties connected with their diagnosis, removal, size and vascularity are well understood. The gross appearance in neoplastic tumors of the kidney is fairly characteristic. In the majority of specimens the tissue consistency is soft, resembling degenerating brain structures. Areas of hemorrhage are very constant and blood cysts may occur.

The tumors vary in size according to their age, but ordinarily when discovered they are large and occupy almost the entire kidney area. Some portion of the kidney outline is usually recognizable. Examination of a cross section will frequently show the kidney tissue compressed between the new growth and the capsule. This is most commonly observed in papillary and sarcomatous growths. It is also seen with the very rapidly growing tumors.

Five reports of primary kidney tumors illustrating striking contrasts in histopathologic changes are herewith presented in detail.

CASE 1.—*Papillary Epithelioma.* This type of tumor in the kidney is rare. Knack[6] reported one case in 1918 of a man of seventy-three years of age in whom the growth was found at autopsy and had developed from the ureter. He discussed the scarcity of such cases and found but nine reported in the German literature up to that time.

Hirsch[7] reported one case of papillary carcinoma of the kidney with metastasis in the brain which was found at autopsy in a patient 58½ years of age. The tumor was soft, cellular and with scant stroma. There was a radial arrangement of the cells about thin-walled blood vessels. Capillaries were clearly defined, forming rosette-like structures in the villi. Numerous necrotic and hemorrhagic areas were found. Hirsh quotes Wohl as having collected 12 cases of this type and Kretschner and Moody 11 cases.

McCown[8] reported one case of papillomatous epithelioma of the kidney pelvis, and stated he was able to find but 10 cases in American literature and 38 cases from foreign sources, making 48 in all. Kelly, Babcock, Watson and Cunningham, Lower, Hyman and Beer, Burford, Parmeter, Mayo and Judd are listed as reporters in American literature.

Braasch[9] has reported that 5 cases were seen in the Mayo Clinic up to Oct. 30, 1920.

Patient, a married woman; aged fifty-one years; mother of five children, who had no history of abortions or miscarriages. *Chief complaints,* frequent urination, pain in the left hypogastric region, and bloody urine. *Present illness* began 7 months ago. A painful area together with a mass the size of a hen's egg developed in the posterior portion of the left side. This apparently did not increase in size. A backache with some burning sensation occurred when urinating. At times blood clots passed in the urine. The patient believed she had passed bloody urine for five years. Nocturia and albuminuria were absent. *Clinical data:* Operation was done in October, 1920, by Dr. C. T. Root seven months after the tumor mass was recognized by the patient. Aug. 28, 1921, Dr. Root reported the patient able to do her own housework and that she was without pain or distress and had gained 25 pounds in weight.

Gross description of the tumor mass: The specimen exhibited an irregular form of a kidney with a partly obliterated marginal line in the pelvic portion. Projecting from the slight concavity of the kidney margin there was seen the pelvic portion and its ureter. This resembled the formation usually seen in hydronephrosis,

Fig. 1.—Malignant papilloma of the kidney, case 1. Cross section of the kidney and tumor mass made 3/4" from the pelvis.

the ureter being dilated to a diameter of 2 cm. This dilation of the pelvis and uppermost part of the ureter was caused by the new growth. The poles of the kidney were quite definitely outlined and projected independently of the tumor mass for a distance of 3 cm.

The new growth had enlarged ventrally and laterally. Complete encapsulation was evident. The surface was roughly nodulated. This was caused in part by the projecting poles of the kidney and in part by irregular bulging incident to the enclosed new growth and hemorrhagic changes, for on cross section just beneath the capsule there were seen areas of hemorrhage and areas of vigorous new growth, causing definite thinning out of the capsule.

On section ventrally from pole to pole at a distance of 1 cm. from the midpoint of the pelvic margin of the kidney, the capsule of the new growth was found at the center on the medial side to be 1 cm. and in the poles 3-4 cm. thick. (Fig. 1.)

The margin of the new growth was sharply defined but in the upper pole there was a separate papillary projection at a distance of 5 mm. external to the margin of the tumor. This occupied the position of an obliterated calyx. Multiple vertical

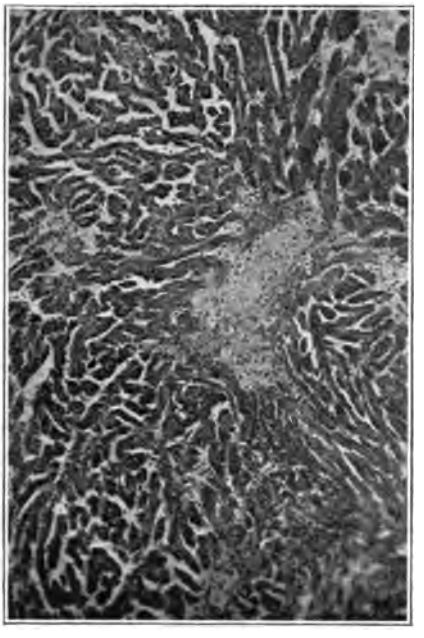

Fig. 2.—(Case 1.) Low magnification showing the papillomatous structure and arboreal arrangement. X-110. Note the areas of hemorrhage and degeneration.

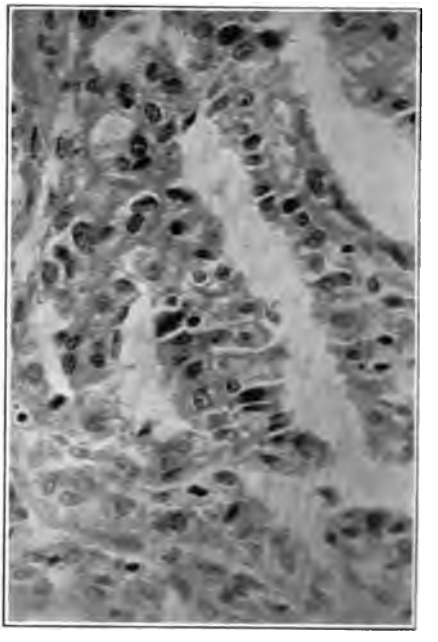

Fig. 3.—(Case 1.) High magnification showing the papillomatous projections. Note the marked anaplasia of epithelial cells irregularly arranged on papillary forms.

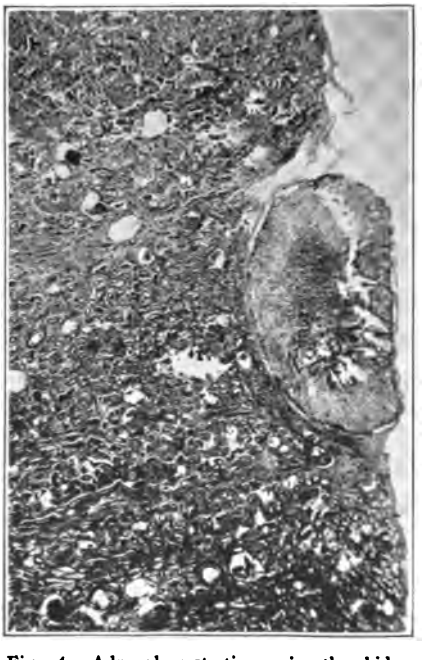

Fig. 4.—Adrenal rest tissue in the kidney capsule from a patient age 69 years.

Fig. 5.—Contrast between kidney cortex and adrenal rest tissue. Magnification X-430.

sectioning revealed a varying thickness of capsule down to 1 mm. upon the lateral surface.

The central portion throughout exhibited numerous recent and old hemorrhages. A tracery of fine light-colored seams could be followed throughout the growth. The older portions of the growth were centripetal and the new portions centrifugal.

The entire new growth portion was of light color except where changed by hemorrhage and necrosis. When torn apart the surfaces presented a minute polypo-arboreal appearance. The fatty capsule was thick and its fat lobules firm and resistant.

Histopathology: The sections taken from parts of the kidney not involved in the new growth change showed compacted tissue with consequently deformed tubular and glomerular units. The poles of the kidney which had the greatest depth of uninvolved structure showed dilated tubules suggesting hydronephros and mild hydropic cellular change. An extensive, fairly well focalized lymphocytic cell infiltration was observed in the pelvic and corticular kidney tissues. Many scarred glomeruli, some interstitial connective tissue increase and considerable pressure atrophy was present. (Figs. 1-5.)

The new growth tissue was predominantly cellular with a delicate stromal supporting structure giving a papillary plical or arboreal assembling. The widest and most distinctive portions of these stromal supports were outgrowths from the epithelial layer of cells in the kidney pelvis. At the interpapillary positions on the epithelial border there were many intact cells. Each papillary form had multiple laterally projecting irregularly shaped arboreal forms of different lengths, which were richly fruited with epithelial cells, not very remotely differentiated from the same type of cells upon the normal epithelial surface of the pelvis.

The growth of the papillary forms was quite uniformly outward in a fungus-like form from pelvis to the outer convexity of the cortex. A marked compactness of the structure was observed in the entire upper portion of the growth. The epithelial cells in the upper portions had not the same systematic positional arrangement observed in the pelvis and there was marked disassociation of their nuclei. Anaplastic changes were not marked.

The capillaries of the tumor were clearly defined at different places and endothelial cells were frequently observed widely detached from vascular structures. The growth was not markedly vascular. There were numerous areas of moderate hemorrhage and some small places of necrosis. Localized areas of small round cell infiltration were frequently observed within the tumor mass.

Diagnosis: Papillary epithelioma of the kidney. A primary growth from the epithelium of the pelvis.

CASE 2.—*Hypernephroma with Metastasis to the Liver, Lung and Spleen.* This type of neoplasm is by far the most frequent of kidney tumors. A clear distinction should be made whether the tumor originated in adrenal or kidney structure. If from the kidney, sex changes never arise. This has been clearly pointed out by Glynn[10] and emphasized by Bowlby and Andrews.[11]

These tumors are of a sulphur yellow color and remarkably soft in consistency. They can become very large and sometimes are sharply outlined or they may be diffused through the renal substance and by rapid growth attain a malignant character. Their cells are large, many-sided and richly filled with fat.[12]

Patient, Mrs. J. S., aged fifty-six, mother of nine children, seven of whom were living and well. Last illness was indefinite in relation to kidney tumor. Ill health began about one year before her death, being initiated with a severe cold which was followed by a bronchial infection and gastrointestinal disturbances, constipation and loss of weight. General weakness was her constant complaint. *Clinical data:* A palpable tumor 4 by 4 inches in size was observed in the right upper abdominal quadrant. The liver was enlarged and hard, but was movable. The hemoglobin was 65 per cent. Slight hyperpyrexia prevailed and there was cachexia. There were no kidney symptoms discovered and there was no record of blood in the urine. Death occurred 13 months after the onset of her ill health. Gross examination of tissues at autopsy included kidneys, liver, lung, spleen and detached tumor mass. The right kidney was 12 cm. in length, 7 cm. in width and 3½ cm. in thickness. The left kidney was 19 cm. long, 12 cm. broad and 7½ cm. thick. Its cortex varied

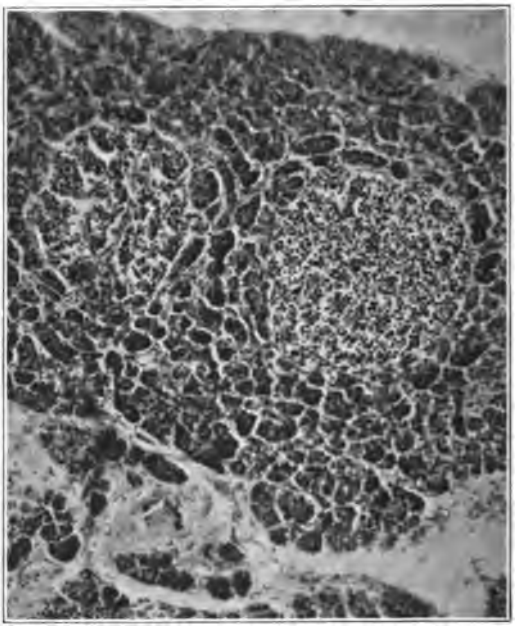

Fig. 6.—Hypernephroma, case 2. Section of pancreas adherent to the tumor mass; note the hypertrophy of the islet structures and areas of fibrosis showing proliferation of islet tissue.

in thickness from 2 mm. to 10 mm. In the area of the lower pole there was approximately 5 cm. of kidney structure with well-defined hypertrophic pyramids. A sharp line of demarcation separated this part from a new growth mass of a soft, yellowish, fatty character in which were band formations. In places necrotic, cystic and hemorrhagic changes were observed. The right kidney was hypertrophic. The liver tissue was hard and contracted excepting an area of new growth change comparable to the mass in the kidney. In the lung and splenic tissues localized changes were observed.

Microscopic examination: A partially encapsuled new growth structure of epithelial character was found with large, irregular, usually polyhedral, light-staining cells attached loosely to a delicate endothelial and connective tissue stroma suggesting the architecture of the adrenal, zona fascicularis. The cell nuclei were usually single, but often multiple. When single their position was usually at or

near the center of the cell and when multiple they were eccentrically placed. The nucleoli were prominent and the nuclear substance was granulated and stained deeply with hematoxylin. A marked prevalence of cell vacuolization was observed, especially in the older portions of the growth, leaving almost a naked capillary framework. In many places old and recent hemorrhages were observed. Tubule forms were not observed in the new-formed tissue. In one section a part of the pancreas was attached to well-preserved actively growing tumor tissue. The pancreatic islet tissue was actively proliferating and its connective tissue was increased. The sections from the liver, lung and spleen showed metastasis of tumor tissue identical with that of the kidney. (Figs. 6-8.)

Diagnosis: Hypernephroma of the left kidney with metastasis to the liver, lung and spleen.

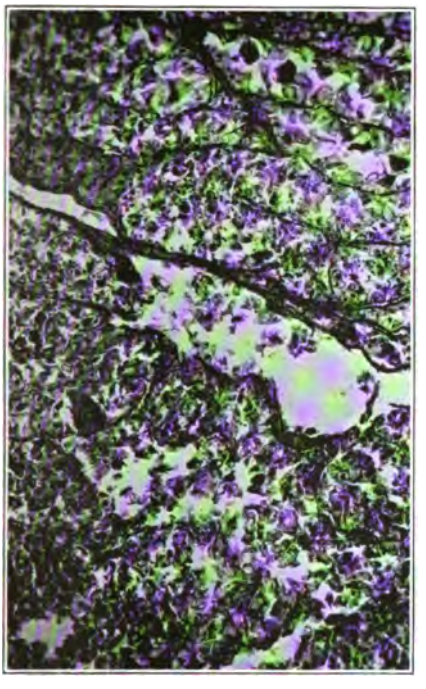

Fig. 7.—(Case 2.) High magnification of new growth tissue. X-430. Note the connective tissue reticulum giving an areolar arrangement of the new growth cells. The vacuolation of the anaplastic cells is best seen in the upper part of the field.

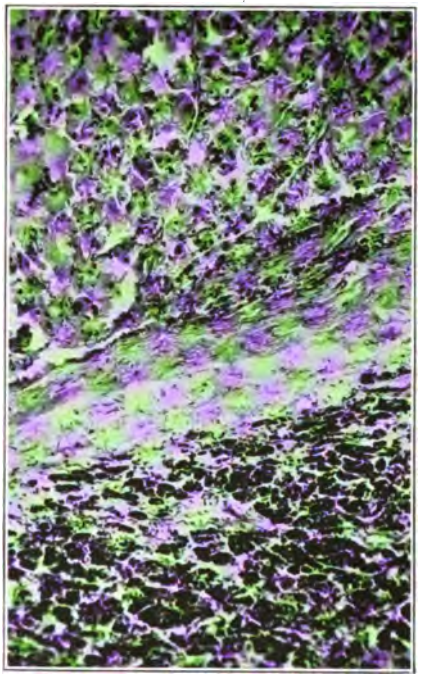

Fig. 8.—(Case 2.) Contrasting pancreas and contiguous hypernephroma structure. Note the anaplasia of new growth cells with giant cell formation to the left.

CASE 3.—*Malignant teratoma.* The derivation of this type of tumor is difficult to trace because of differentiation and developmental unknowns. It is most satisfactory to recall that myotome may give striped muscle fibers, scleratome may yield cartilage, mesenchyme may produce connective tissue including smooth muscle and possibly vessels and the intermediate cell mass the glandular or epithelial formations. It is also to be considered that the intermediary cell mass middleplate in the myotome and in the mesenchyme may yield mixed tumors.[13] Junkel[14] says these cells of undifferentiated tissue have

failed to take part in the ulterior cellular differentiation and for some unknown reason begin to grow and differentiate themselves in the grown-up organism. It is useless to attempt a summary of the literature of this type of tumors, there being but few cases reported in detail and all differ in interpretation of essentials.

Patient, Miss E. G., aged sixty years. *History:* About six months before her demise there was general malaise, loss of weight and appetite. Three months later occasional pain of a dull, aching character was felt in the left lower quadrant and back. This gradually increased in frequency and severity until it was almost unbearable. A mass just above the iliac crest appeared with the onset of pain and increased to a large tumor which was palpable over the entire side. Palpation or pressure over the area was painful. Micturition was frequent and painful.

Fig. 9.—Malignant teratoma of the kidney, case 3. Connective tissue portion of the tumor. Low magnification X-110. Note the fascicles and interlacing fibers of connective tissue and muscle cells, the marked cellularity of tne structure, and the vascular spaces.

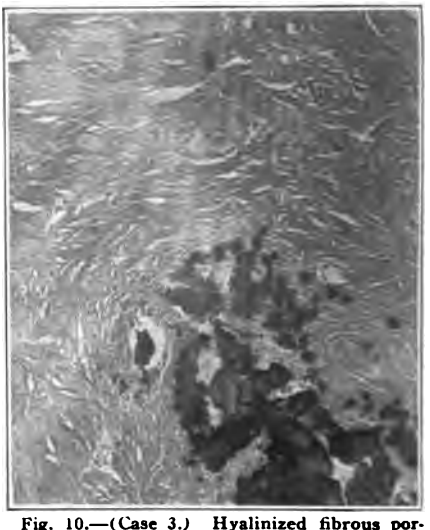

Fig. 10.—(Case 3.) Hyalinized fibrous portion of the tumor. Low magnification X-110. Note the vascular spaces, the dense acellular type of architecture, and the deposits of calcium salts in the lower right corner.

Clinical data: Repeated urinalyses were negative. Kidney efficiency tests were negative until later when the output from the left was 12 per cent in 15 minutes. Catheterization and roentgenogram showed the left ureter displaced medially and the presence of an irregular homogenous mass. The total white cell count was 17650 and the polymorphonuclear cells were 80 per cent. Operation by Dr. Ray Andries revealed a retroperitoneal tumor mass involving the lower pole of the left kidney and extending medially across the spinal column to the right side and adhering to the surrounding tissues. The postoperative shock was severe. Death occurred 27 days following her operation. Autopsy was not obtained.

Gross description: The specimen was an irregular hunter's horn shaped mass of tissue with a well-defined upper pole, preserving a fairly normal kidney outline. The dimensions of the mass were 15 cm. long by 9 cm. wide across the lower pole, and 6 cm. thick. A portion of the mass at the lower pole, including the capsule was torn away. When vertically sectioned the tumor mass was shown to be 8 x 8 x 6 cm. in size. A well-defined encapsulation was seen along part of the upper sur-

face. The substance of the new growth mass was partially soft, and light-colored, the structure was partially fibrous and cartilaginous in character. Evident extension through the capsule had occurred at the lower pole and outer lower convexity.

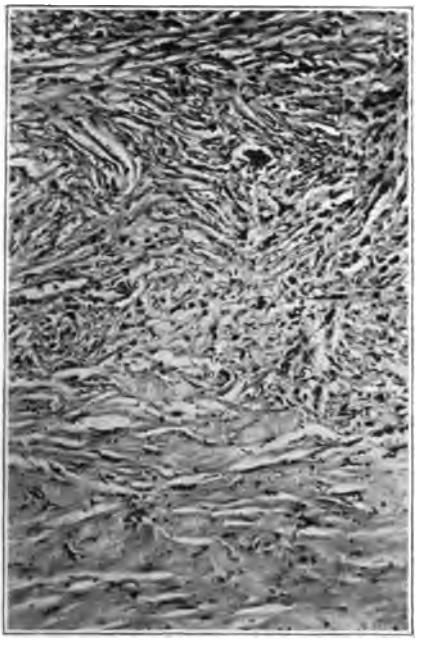

Fig. 11.—(Case 3.) Fibrous tissue portion of the new growth. Low magnification X-110. Note the irregular diffuse arrangement of new growth tumor cells and the atrophy and anaplasia of cells.

Fig. 12.—(Case 3.) Area of anaplastic epithelial new growth cells. Low magnification X-110. Note the solid mass of large epithelial cells showing abundant cytoplasm and round or oval nuclei.

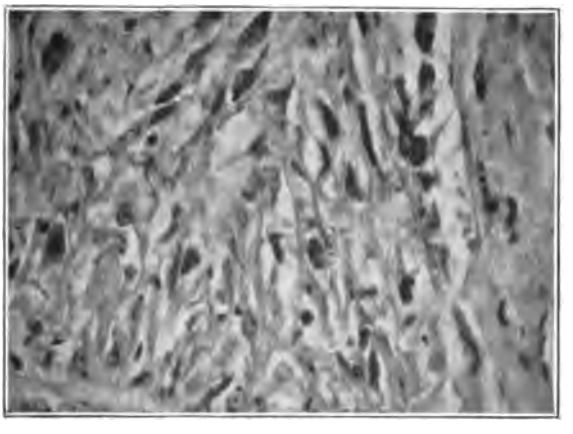

Fig. 13.—(Case 3.) Fibrous portion of the tumor. Note the hyalinized tissue in the upper part of the field, the thin-walled blood spaces at the line of demarcation, and the anaplasia of new growth connective tissue cells.

At the upper border of the tumor mass what appeared as capsule was identified as distended displaced pelvic wall. The ureter was not seen.

Microscopical examination: The kidney tissue not involved by the new growth exhibited early albuminous degenerative changes with irregular tubular dilatation

and some blood casts, also slight local interstitial tissue increase, a few scarred glomeruli and small round cell infiltration, particularly in the pelvic tissues. In sections from the hilum of the kidney there was a partially walled-off tumor mass which in places flattened out the calyces and compressed the contiguous kidney structure. The structural units of connective tissue, muscle and epithelium were clearly definable. In parts where fibrosis, hyalinization and calcification were prominent, cartilage was in question. There were places where atypical tubules were recognized. In the more acellular tissues very prominent lacunar spacings were found. The parts of the tumor constructed from connective tissue and muscle elements had a prominent fasciculated and interlacing architecture. The cells in the connective tissue structure were distinctly more anaplastic than in either the muscle or epithelial tissues, but the two later types were better differentiated. The connective tissue cell nuclei were very irregular in size and shape and many were multinucleated. The muscle cells were fairly uniform. The epithelial areas of the tumor had rather small and almost uniform sized cells, many of which were vacuolated. The stroma was very scanty and vascularity was not marked. A fatty degeneration was observed in certain areas. (Figs. 9-13.)

Diagnosis: Malignant teratoma of the left kidney.

CASE 4.—*Squamous and spheroidal celled carcinoma of the kidney.* Primary carcinoma is rare in the kidney. Ewing[15] speaks of these tumors as remarkable and of large size and of their relation to leukoplakia and calculi. Bowlbey and Andrews[16] mention carcinoma of the kidney, though rarer than sarcoma, as not uncommon in adults and that it may originate in the pelvis and be of the squamous type. More frequently it originates in the cortex and is spheroidal or columnar-celled.

Patient, Mrs. M. LaT., aged sixty-two, mother of 3 children. *Last illness:* Duration approximately 4 months. The onset of symptoms was characterized by aching in the left hip and, when severe, radiation down the leg. In 6 months there was a loss of 35 pounds in weight, but no urinary disturbances occurred.

Clinical data: A large, hard nodular mass was palpable in the left lumbar region. The urine examination was negative and the blood picture indicated a moderate secondary anemia. At operation the left kidney was removed by Dr. Geo. E. Potter. It was found to be 8 inches long, 4 inches wide and 5 inches thick and showed that extensive degenerative changes had occurred throughout the entire organ. The patient died in 23 days after her operation.

Gross examination: The specimen was not intact and fragmentation of the tumor in its pelvic portion was evident. The thickness of encapsulation by the compressed displaced renal tissue varied from 2 cm. to 2 mm. The tumor areas were of whitish color and of fairly firm consistency and occurred as multiple areas when viewed from the cut flat surfaces. Extensive involvement was evident and the pelvis showed the older growth of tissue.

Microscopic Pathology: In sections from the pelvis of the kidney the new growth tissue was composed of compact squamous and spheroidal, closely arranged cells with but little or no intercellular substance. The formation was an irregular stratified layer replacing the pelvic epithelium while the tissue from the cortex exhibited marked compactness of structure with a rich deposition of intercellular substance. The blood vessels of this part were few in number and small, but in the pelvis they were numerous, thin-walled and dilated. There was no positive alveolar arrangement of new growth structure, but infiltration of tumor cells in columns replaced the renal structure. In the greater part of the entire new growth coalescing of the cell groups prevailed and the involvement extended quite generally to

all parts of the kidney. The tumor cells showed a most pronounced anaplasia and unusual cell division changes. The cell nuclei were exceedingly irregular in shape and number. Epithelial pearl formation was not prominent. The kidney structure was rapidly and diffusely undergoing tumor cell metaplasia. In the pelvis and medulla chronic infection and hemorrhage were marked. In the cortex compression changes were prominent and many scarred glomeruli were found, but no evidence of calculi was observed. (Figs. 14 and 15.)

Diagnosis: Rapidly growing squamous and spheroidal celled carcinoma, originating in the kidney pelvis.

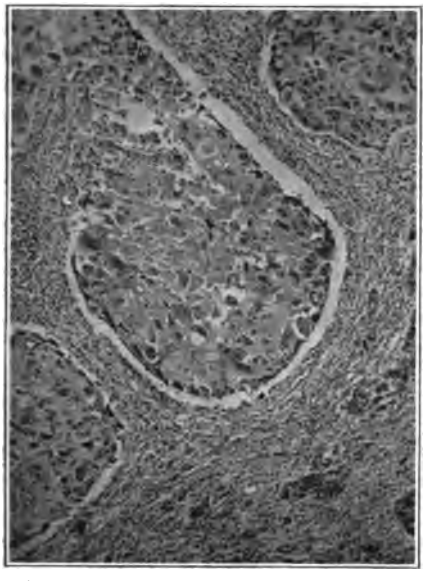

Fig. 14.—Primary carcinoma of the kidney, case 4. Low magnification of kidney tissue showing the invading epithelial new growth. (X-110.) Note the few isolated kidney tubules in the lower right corner and the solid masses of flat new growth epithelial cells.

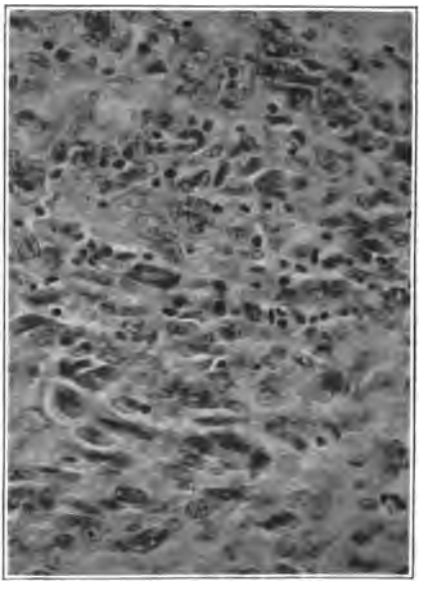

Fig. 15.—(Case 4.) High magnification of new growth cells. X-430. Note the marked anaplasia of cells.

CASE 5.—*Lymphoblastoma.* The literature upon this type of kidney tumor illustrates an unsettled classification and careless nomenclature. (Longhuame.[17]) The occurrence of this type of tumor in children under 5 years is relatively frequent. Its size is sometimes very large, reaching ½ the weight of the child. In renal tumors of infancy the round and spindle cells are nearly always found.

Patient, Philip S., aged seven months. The tumor was unnoticed until a few days before death. During the last five days the abdomen had become greatly distended and the patient appeared exsanguinated. A tumor mass extending from the costal margin to the lower border of the pelvis and three finger-breadths to the left of the median line was easily recognized.

Clinical data: Abdominal exploration was done by Dr. Jas. A. MacMillan, but removal of the tumor was deemed impossible. Severe hemorrhage followed the removal of some tissue from the tumor mass. Death occurred a few hours later.

Autopsy Examination: Revealed a tumor mass filling the entire right half of

the abdomen, extending from the dome of the diaphragm to the inner aspect of the ileum and extending transversely 6 cm. to the left of the umbilicus. The ascending colon crossed the tumor mass obliquely, ascending from the right outer margin

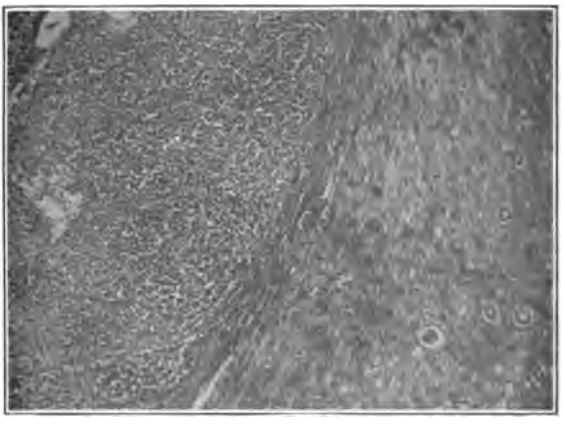

Fig. 16.—(Case 5.) Malignant embryomata of the kidney from a child 7 months old. Low magnification showing the line of demarcation between new growth and kidney tissue. (X-110.) Note the pressure changes in the kidney tissue in the upper part of the field.

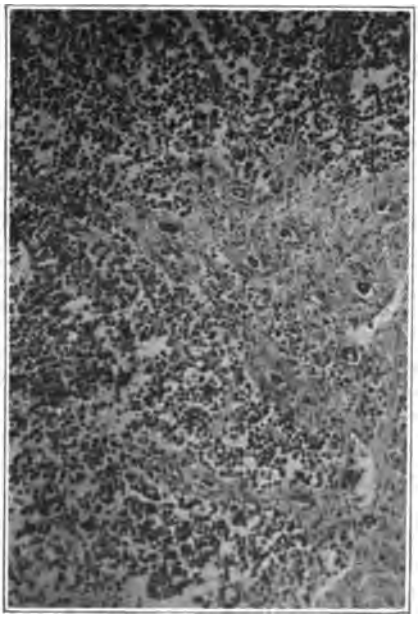

Fig. 17.—(Case 5.) Section of new growth tissue with kidney tubules at the right. Low magnification X-170. Note the marked pressure atrophy of the kidney tubular structure, the irregular line of demarcation between kidney and new growth.

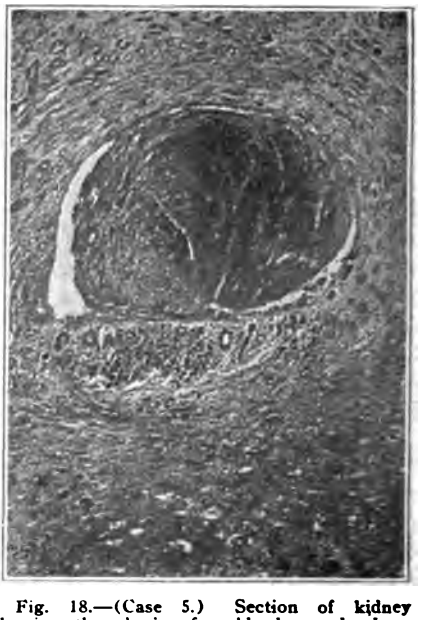

Fig. 18.—(Case 5.) Section of kidney showing thrombosis of a blood vessel. Low magnification X-110. Note the focal aggregations of tumor cells below the blood vessel.

of the lower pole across the mass to the median line, carrying the hepatic flexure toward the median line. The capsular surface of the tumor was thickened, distended and nodulated. The ureter was free and the adrenal was uninvolved. Two

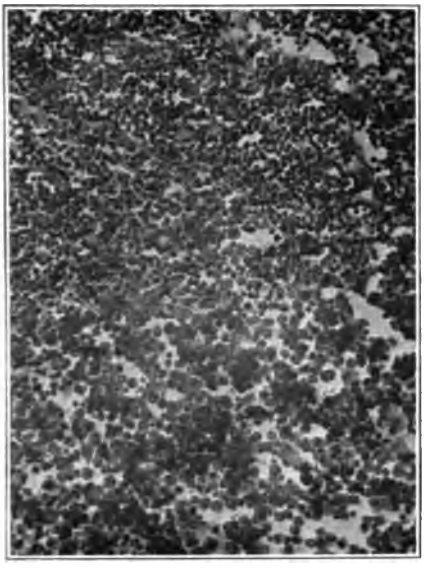

Fig. 19.—(Case 5.) New growth metastasis in a contiguous lymph node X-430. Note the marked anaplasia of cells. The larger cells in the lower half of the field are the anaplastic cells.

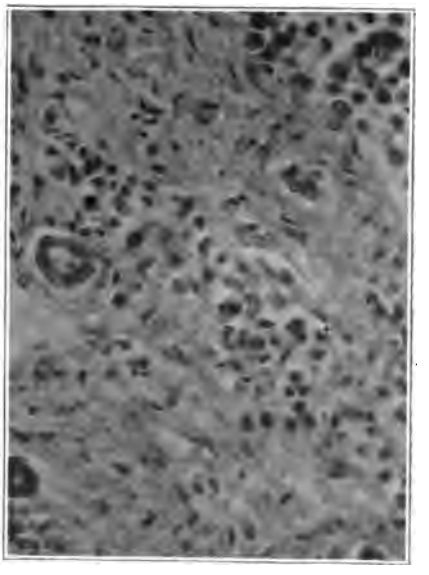

Fig. 20.—(Case 5.) Line of demarcation between kidney tissue and the new growth cells on the right. X-430. Note the degenerative changes in the kidney tubules, the interstitial tissue increase, and the extension growth of anaplastic cells in the center and right portion of the field.

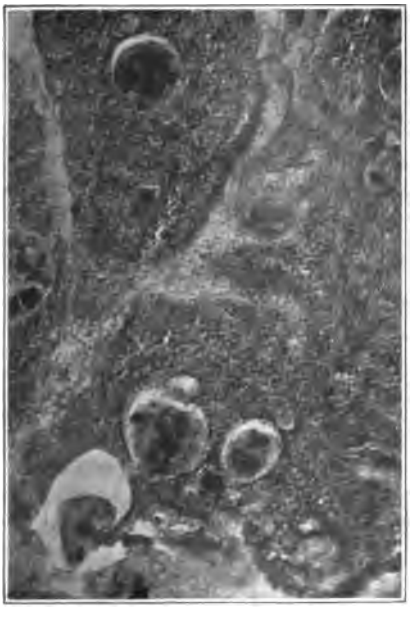

Fig. 21.—(Case 5.) Section of thymus gland showing premature ageing. Note the hypertrophic Hassel's corpuscles and fibrous tissue increase in the septae.

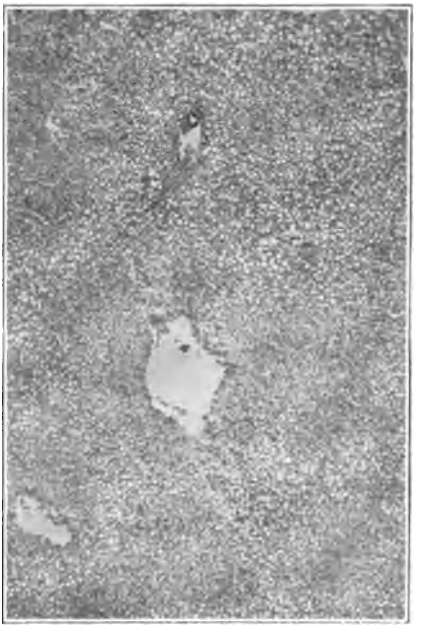

Fig. 22.—(Case 5.) Section of liver showing marked fatty degeneration.

lymph glands were involved, but with this exception the new growth appeared entirely intrarenal.

The tumor mass was firm and appeared indistinctly lobulated. Considerable hemorrhage had occurred within and without the tumor. The left kidney showed slight hypertrophy and moderate cloudy swelling. The liver was very pale and yellow, suggesting hemorrhage and fatty degeneration. The right adrenal was firmer and somewhat smaller than normal.

Histopathology: The sections from the ovary, thymus, thyroid and adrenal tissues showed advanced ageing of these structures. The liver was uniformly undergoing fatty degeneration. The tissue of both kidneys was markedly advanced in development. The characteristic narrow cortex crowded with small glomeruli was changed to correspond with a development of eight or ten years. The renal interstitial tissue was irregularly increased.

The new growth was extensively infiltrated through the greater part of the right kidney by cells indefinitely comparable to lymph cells, but the majority of the tumor cells were, however, more than double their size as shown in the photomicrograph of the invaded lymph gland. A considerable number of these cells were morphologically like very young connective tissue forms. All of the neoplastic cells were hyperchromatic and anaplastic. A fine stroma of capillaries prevailed in all parts of the new growth. Cell division forms were numerous and giant cells were seen. Multiple hemorrhage occurred throughout the mass and many thin-walled dilated vessels were evident. (Figs. 16-22.)

Diagnosis: Lymphoblastoma of marked malignancy in the right kidney and mesenteric lymph gland metastasis.

SUMMARY

1. The developmental history of the renal tissues is yet incomplete and at many points theoretical. 2. The histogenesis for tumor tissue of the kidney is intricately involved by existing obscurities in both ontogenetic and phylogenetic development. 3. The frequency of renal neoplasia occurrence is again emphasized as selective of young and old age periods of life. 4. The diagnostic symptomatology is frequently exceedingly indefinite. 5. Clinical and pathological investigation of renal tumors should be carefully made and reported in the literature. 6. The five cases are here reported as primary renal tumors. All have been carefully studied to exclude metastatic origin.

BIBLIOGRAPHY

(1) *Felix, W.:* Keible and Mall, Embryology, p. 753. (2) Ibid., p. 753. (3) *Ryder, J. A.:* Proc. U. S. Nat. Mus., 1886, p. 80. (4) *Schafer, E. A.:* Text Book of Microscopic Anatomy, p. 4. (5) *Kingsley, J. S.:* Comparative Anatomy of Vertebrates, ed. 2, p. 337. (6) *Knack:* Deutsch. med. Wchnschr., 1918, xliv, 982. (7) *Hirsch, E. T.:* Arch. Int. Med., xxi, 231. (8) *McCown, P. E.:* Jour. Am. Med. Assn., Oct. 30, 1920, lxxv, 1191. (9) *Braasch:* Ibid. (10) *Glynn, E. E.:* Quart. Jour. Med., Jan., 1912, v. (11) *Bowlby and Andrews:* Surgical Pathology, ed. 7, p. 419. (12) *Thierry:* Aus der Privatklinik von Hofrat Krecke in München, May 27, 1921, p. 638. (13) *Buerger and Lautman:* Am. Jour. Surg., 1914, xxviii, 453. (14) *Junkel:* Arch. f. klin. Chir., 1914, ciii, 940. (15) *Ewing:* Neoplastic Diseases, 1919, p. 743. (16) *Bowlby and Andrews:* Surgical Pathology, ed. 7, p. 421. (17) *Longhuame, F. McG.:* Brit. Jour. Surg., 1914, ii, p. 77-91.

DISCUSSION

DR. GEORGE GELLHORN, ST. LOUIS, MISSOURI.—It seems a far cry between the adrenals and gynecology and yet, several years ago I published a case which shows that there may be a close connection between the two. The patient, a woman of sixty-four, was admitted to the hospital because of symptoms of mental confusion. She seemed to have pain in the left side of the abdomen, and on examination a large retroperitoneal tumor of obscure origin was found in that side. The next day when the nurse reported a suspicious vaginal discharge I was asked to examine the patient and found in the anterior vaginal wall just below the urethral swelling two small tumors the size and color of red raspberries, which could easily be shelled out with the finger nail. These were removed and when I examined them microscopically, I found adrenal structure. The large tumor, then, was diagnosed a hydronephroma. A few days later the woman died and on autopsy this diagnosis was confirmed.

Such vaginal metastases seem to be rather rare, because on careful search only nine other cases could be found in the literature. Whereas hydronephroma metastasizes quickly and extensively in other parts of the body, the genital system seems to be very rarely involved. However, I have a suspicion that many of the so-called primary sarcomata of the vagina, particularly in children, are in reality, secondary to undiscovered hydronephroma higher up. It might be wise, in the future, to think of the possibility of hydronephroma if one encounters such a vaginal tumor.

DR. DAVIS, (closing).—I desire to emphasize the age incidence of my cases. The first was fifty-one years of age, a female; the second was a patient fifty-six years of age, a female; the third was sixty years of age, a female; case four was a patient sixty-two years of age, a female; and case five, aged seven months, was a male.

A PLEA FOR ROUTINE EXAMINATION UPON THE OPERATING TABLE AS A PRELIMINARY TO ABDOMINAL OPERATIONS

By John W. Keefe, M.D., LL.D., F.A.C.S., Providence, R. I.

WHILE the modern trend to subdivide the practice of medicine into numerous specialties has many advantages, yet, we must admit, that it is attended with a number of evils. Americans are characterized the world over as appearing always to be in a hurry. The mad rush for quantity production in the business world which, we must acknowledge, has developed efficient and large business organizations should not be applied to the care of the sick. It was but natural that the methods of practicing medicine should be modified by our contact with this prevailing spirit in business. Not only is it desirable, but very necessary, that we allow sentiment to enter into the practice of medicine, because it is impossible to eliminate the human element in the care of the injured and the ill. If we take the hospitals of this country, by and large, as organized today, we shall note the small amount of time the attending surgeon devotes to his examination and to the acquisition of personal knowledge of the patient upon whom he is about to operate. How much consideration does he give to the diagnosis of the ailment, and how much to the selection of the most preferable operative procedure to be employed?

One may take at random a large clinic in any sizable city and if the whole truth were known, we will find that the history was taken and the urine, blood and physical examinations were made by different people, the results of their work being hastily passed upon by some assistant or house surgeon. Many times, we have noted that the surgeon saw his patient for the first time when anesthetized and ready for operation. He then had the history read and that the probable diagnosis was arrived at by his assistants. Even then, he seldom takes the time to make a careful physical examination including bimanual, vaginal and rectal examinations, because it is time consuming; and yet, how often the lack of this study of the case has led the surgeon far afield and at times with disastrous results to his patient.

I have in mind an operation, witnessed a short time since, where a very competent surgeon had a patient on the table with a diagnosis, made for him, of carcinoma of the pelvic colon. The x-ray plate that was exhibited, showed a filling defect which the radiologist said was due, in all probability, to a malignant growth. The operator described the method of resection of the intestine, which he would in all like-

lihood pursue. If he had devoted a few minutes only to a combined abdominal, vaginal, and rectal examination, he would have learned that he was dealing with several uterine fibroid tumors, together with pus tubes and would have had a clearer idea of how to attack the pathology present through the abdominal incision. He was so certain of finding a malignant growth that he ruptured a pus tube and thereby spread the pus among the coils of intestine and, for a time, was at a loss to realize the exact condition of affairs and, consequently, he did a rather inferior operation.

We find in another patient, operated upon by an equally eminent surgeon, that the roentgenologist made a diagnosis of diaphragmatic hernia, although the plate was not very clear, as the barium shadow of the intestine interfered with a distinct outline of the left diaphragm. A competent internist, obsessed with the diagnosis made by the radiologist, thought he heard succussion sounds and a tympanitic note, in the chest.

When a portion of rib was excised and the pleural cavity opened, there was found no evidence of an opening in the diaphragm; therefore there was no subdiaphragmatic hernia.

If the surgeon had not depended, in so large a measure, upon his associates and had examined the chest himself by auscultation and percussion and had pointed out to the roentgenologist that his plate could be improved upon, I doubt if he would have fallen into the error of performing this unnecessary operation.

In another city, a surgeon with a well deserved national reputation, opened the abdomen of a girl sixteen years old, because the house surgeon had made a diagnosis of gastric ulcer which was based upon the history of the patient and the examination of the stomach contents. A thorough exploration of the abdominal viscera revealed nothing abnormal. Is it not fair to presume that this child will suffer from subsequent adhesions? Why should not the surgeon possess a more definite, individual, knowledge of each and every case and place less dependence upon the findings of subordinates? Apparently, the reason why the above mentioned time consuming practice is not followed more closely is the tendency of modern surgery toward quantity production.

Any one who has not been in the habit of making routine examinations of the abdomen of the anesthetized patient, will be surprised at the frequency with which his diagnosis can be improved upon or clarified. I have the patient placed in the lithotomy position, the thighs flexed upon the body and the feet placed in stirrups or held by assistants. The pubes, vulva, and vagina are scrubbed with liquid soap and water and flushed with a one to two thousand bichloride of mercury solution. The patient is then catheterized as it has been found

that, occasionally, the nurse may have omitted to instruct the patient to pass urine just previous to going to the operating room and some patients secrete a large amount of urine during anesthesia.

The abdomen is now carefully examined by palpation and percussion followed by a combined vaginal, abdominal and rectal palpation. The whole procedure may take five minutes, but it is time well expended, as the operator has then a clear idea of the size, location, mobility and characteristics of a growth, if present, and should it be necessary to remove a growth, he can then decide whether the vaginal or abdominal route is the more preferable. He may even, by these methods of examination, conclude that medical, rather than surgical treatment would be most helpful to the patient. I cannot advocate too strongly routine examination of the patient under anesthesia, upon the operating table preliminary to abdominal operations.

Unquestionably, the division of labor has a number of things to recommend it and the concentration of effort upon one subject has made for progress in medicine. When you consider the men of the past who have advanced our knowledge of the various specialties, you will find that most of them were general practitioners of medicine and undertook intensive study of some specialty, only after a prolonged experience. This valuable knowledge, as being of the very fabric of their minds, they daily employed when practicing in their limited field of work.

We find that the tendency of the day is for one to become a specialist with very little effort, study, and time spent to perfect himself. A few months at a postgraduate school and that, too, with scarcely any knowledge of the general practice of medicine, outside of a meager hospital experience, is the extent of this inadequate training. The result of such insufficient preparation we observe in the frequency with which the important lesion, from which the patient is suffering is overlooked as the narrow vision of the specialist cannot see beyond his contracted field.

Are we not overspecializing? Should we not look upon the complex human body as a single entity, with its multifarious structures, brain, nerves, heart, blood vessels, glands, teeth, etc., carefully adjusted and attuned to work in harmony one with the other? A few men gifted with foresight, realizing the necessity of taking advantage of modern scientific work and desirous of utilizing the labor, experiences, and opinions of others, have established groups including men, trained in the various specialties, to work together.

In order to have a group function properly, its members must first of all be men of character and be willing to work in harmony with one another and give of themselves unselfishly, for the advancement of the science of medicine and the welfare of their patients. A daily con-

ference of the group should be held and the opinions of the members discussed and analyzed. The member with the largest experience and most logical mind should correlate all of the information, make the diagnosis and outline the treatment and advice to be given to the patient.

This type of group practice can and will help to advance the progress of medicine in this country; but the general practitioner should and shall always find valuable work to accomplish. There are groups today who merely have offices in the same building and agree to refer patients from one member of the group to another. These bodies, not founded fundamentally for the welfare of the patient, will prove to be a detriment to the advance of medicine in the community wherein they practice.

The public today is so impressed with the word specialist, that many no longer consult the good old family doctor; but select this or that specialist, even the x-ray specialist, for a diagnosis. Is this the most desirable procedure on their part? Decidedly, it is not. While radiography many times gives us very valuable information, how often do we, on the other hand, find the results of this study misleading.

When shall we have definitely impressed upon our minds, that an x-ray plate reveals to us a shadow superimposed upon shadows and that these shadows may be interpreted with great difficulty, or not at all? Should we not employ the x-ray only as an adjunct to diagnosis? The surgeon who is to operate should first make a careful examination and study of the complete history of the patient and then evaluate with the radiologist, his findings.

But some one will say, how is the busy surgeon to find the time for all this labor? I would answer, that first and foremost he should have the welfare of his patient at heart and that it would be better for his clientele if he did fewer operations in a day, paid more attention to a thorough study of the individual, his personal characteristics and his ailments, more to the performance of a skillful operation and less to the work of subordinates, who often unintentionally give him misleading information.

In contrast to the hurry which infects us all today, let us pause to reflect upon the leisurely work of one of our predecessors; allow me, for a moment, to dwell upon the activities of one of the pioneers in gynecology and abdominal surgery, namely, Doctor Gilman Kimball of Lowell, Massachusetts.

A glance at his portrait reveals the spirit and character of the man. The massive head, the broad brow, the keen eye, the thin and compressed lips and the determined expression of his countenance, all go to prove that he was a man of power, strongly impressed with the courage of his convictions. Born in the obscure village of New Chester, New Hampshire, in 1804, he ultimately attained to an international

reputation for his skill in the removal of ovarian tumors. His father was a merchant in the village, and though probably not rich, yet he stamped upon his son a quality, invaluable at any time, which we know as character.

The subject of our sketch studied with the elder Doctor Edward Reynolds of Boston and received his degree of doctor of medicine from Dartmouth, in 1826. He practiced in Chicopee, Massachusetts, for two years and then spent a year in study at Paris, where he was fortunate in having an opportunity at the Hotel Dieu to follow the instructions of Baron Dupuytren, who was considered the foremost teacher of surgery in Europe at the time. It was at this period that he acquired confidence in himself and inspiration from this master mind, which later he was to use to advantage, in his pioneer work in this country.

In 1830 we find him settled in Lowell, Massachusetts, in a town of less than twenty thousand inhabitants, where he practiced until his death, which occurred in 1892. In 1842 he succeeded Doctor Willard Parker as professor of surgery at the medical college of Woodstock, Vermont; and one year later, he occupied a similar position at the Berkshire Medical Institute at Pittsfield, Massachusetts.

Surgery has been the loser by the passing away of these peripatetic teachers of medicine, as there are many things to recommend this custom. It is possible that we may again, some day, revert to this method of inspiring young men, by having the masters in medicine lecture as exchange professors in the various universities.

During the Civil War, Doctor Kimball superintended the organization of the first military hospitals established for the sick and wounded of the union army and, after a year of service, he was retired, having contracted malaria.

As early as 1855 he operated for the removal of an ovarian tumor and gained a world wide reputation for the skill achieved in this class of surgery. We must remember that at this period the operation was considered by many to be unjustifiable. The pathway of Doctor Kimball in his advocacy of the removal of ovarian tumors was not strewn with roses, as we may note in an article published in the Boston Medical and Surgical Journal, Sept. 22, 1864, when the editor quotes from the American Medical Times, as follows: "I may further urge in my own behalf as well as that of my surgical brethren generally, that the diagnosis, in the majority of cases of ovarian disease, is very obscure and that the prognosis is to the same extent doubtful, if not unfavorable; that many females carry these tumors through a long life with comparatively little inconvenience; that in many cases they actually diminish in size, while the inconveniences attending them often nearly disappear; that the most favorable statistics show that nothing is gained, on the whole, as regards the prolongation of life by the opera-

tion, for it is found that taking an equal number of females affected with ovarian tumors of equal ages and under as nearly as possible similar circumstances, the average duration of life will be greater in those on whom the operation has not been performed, than in those who have submitted to it; so that statistics in fact condemn the operation. In all the other great operations the surgeon has no misgivings; he is laid as it were under duress, as Prof. Meigs would say, to operate if circumstances required and he has no severe qualms of conscience should the case prove afterwards fatal. Far otherwise, however, must it be with every properly constituted mind when a fatal result attends an operation regarded as wholly unjustifiable by the highest authorities in surgery and by nine-tenths of the profession generally. From what has been offered, it may safely and justly be inferred that our principal surgeons do not envy the professional reputation acquired by the operation in question; they do themselves honor by showing that they have studied ethics in a wider school, and that they prefer peace of mind and a good conscience, to transient notoriety and pecuniary rewards."

On Jan. 24, 1864, Doctor Kimball refuted in the Boston Medical and Surgical Journal the statement that in not a single instance in Boston, could a fortunate termination of this operation, namely, removal of an ovarian tumor, be recorded; Doctor Kimball pointed out that his first three cases operated upon in Boston, terminated successfully, and that the fourth case, an unsuccessful one, he had reported the previous December. He was called as a consultant and operated throughout New England and had the happy privilege of living long enough to see the prejudices and opposition to this operation disappear and to receive the approbation of surgeons both at home and abroad.

I am indebted to Doctor John W. Mitchell, late of Providence, for the following report of a case for the removal of an ovarian tumor; a large unilocular cyst, wherein he had assisted Doctor Kimball at the operation, which took place in a farm house located several miles from Providence. Doctor Kimball arrived two days before the day set for the operation, and lived at the farm house where he could examine his patient, observe her general condition, and carry out the preliminary medical treatment and make the necessary preparations for the operation. The kitchen table served as an operating table, and the wash boiler provided an abundance of hot water. The instruments were washed in hot water, dried and placed upon a clean towel. The doctors scrubbed their hands and forearms with soap and water. When the patient was etherized her abdomen was washed with soap and water, and clean towels were placed about the field of operation.

Doctor Kimball then made an incision about four inches long between the umbilicus and pubes. The cyst which presented in the wound was pierced with a large trocar and after a gallon of its con-

tents was removed, it was drawn from the abdominal cavity, and the pedicle transfixed and ligated with double stout silk. The tumor was then severed distal to the ligature and the stump of the pedicle, and the ends of the ligatures were fixed in the lower angle of the wound. The wound was closed with interrupted silk sutures, which included all the abdominal layers. The dressing consisted of the application of lint, adhesive plaster and a cotton cloth binder. One-third of a grain of morphia was administered and repeated at intervals. Liquid nourishment and some alcoholic stimulant, usually rum, was given early and often. A rectal tube was employed to relieve the patient of flatus; enemas also assisted in the recovery. The silk ligatures came away about the seventh day, and the patient made an excellent recovery, as the wound healed about the fourth week. Doctor Kimball remained at the house of his patient for two days following the operation and left when he considered that she was progressing favorably, and gave to Doctor Mitchell the after care of the case. Doctor Kimball was possessed of a logical mind and honesty of purpose, always firm in his convictions when confident that he was right. He contributed in a large measure to the progress of surgery, both in this country and abroad.

In conclusion, I would emphasize: 1. The value of routine examinations under anesthesia upon the operating table, preliminary to abdominal operations. 2. The necessity of a period to be spent in the general practice of medicine previous to becoming a specialist. 3. That we consider the human body as a moving equilibrium, in brief, as a living unitary organism. 4. The desirability of the masters in medicine becoming peripatetic and lecturing as exchange professors in the various universities. 5. Above all, the importance of remembering that careful work demands time and personal attention to those multifarious details which modern medicine requires.

DISCUSSION

DR. RUFUS B. HALL, CINCINNATI, OHIO.—I wish to emphasize the necessity of personal examination as well as under an anesthetic in cases where doubt exists. I have in mind, an incident of a distinguished operator, who went to the country some years ago to operate on a large tumor in the abdomen, which the family physician said was an ovarian tumor. This man was willing to take the word of the family physician. The preparations were made and this doctor did not see the patient until she was anesthetized and on the table. He made a few remarks to those present and opened the abdomen, and found the supposed tumor to be a pregnant uterus. Unfortunately, the woman promptly aborted.

In obscure cases where I could not convince myself of the diagnosis, and considered additional examination necessary, I have given a general anesthetic, not only on the operating table but before giving an opinion to the family of the patient.

I recently had an interesting case, a woman of about thirty-five years, who had been through many hands, and who had received many different diagnoses. They

told me of these different examinations and the different opinions that had been given. The woman had a tumor two or three inches long and four or five inches broad in the upper part of the abdomen. This had been diagnosed as a kidney, as a spleen, and so on. I went over the patient and said I would not give an opinion until I had given an anesthetic. The patient agreed to this and after an examination under an anesthetic I said my diagnosis was a cyst of the mesentery, and operation was confirmatory.

DR. MILES F. PORTER, FT. WAYNE, INDIANA.—In these days when so many of us are infatuated with figures and facts and ultrascientific methods of examination, instruments of precision, and so forth, in these days I say, it is exceedingly refreshing to have a paper of this sort read before this Association, and especially by one who cannot be blamed—as some of us might perhaps—with having passed the age at which he perhaps for the good of humanity should have retired, if not died.

I want to emphasize with all the force of my feeble power the general trend of this paper. It will be a sad day for humanity when medicine and surgery come to be practiced largely by rule of thumb. I feel that Dr. Keefe feels as I do, that we should avail ourselves to the limit of every advantage that has been offered us in the way of laboratory and other scientific means for the purpose of diagnosis, but after all there are in many cases—and I fancy in most of them—many things to be learned by correct history taking and physical examination.

Within the last few weeks two cases have been referred to me for cesarean section, and in neither case was cesarean section performed. One case sent by a reputable practitioner gave the following history: the woman several years before had a very difficult forceps delivery, which resulted in a dead baby and a very badly lacerated perineum. She was subsequently advised that she must never attempt having another baby in a normal way, and the examination on which this advice was based included the measurements of the pelvis. With this history she was sent to me two weeks before labor was expected with the idea of having a cesarean section. I spent an hour or so in taking her history, and on the next day made a careful physical examination. The patient was a well formed woman. Previous delivery was her first baby and she had been delivered in ten hours after the first pain. She had a badly lacerated cervix. So far as my fingers could tell she should have a normal labor. Mentally I concluded that the trouble had been not a small pelvis but perhaps the doctor who got excited and was urged on by an overexcited husband and mother, and he attempted to deliver the woman before the cervix was dilated. I decided not to attempt cesarean section without giving this woman a chance at normal labor. On measuring the pelvis it was found a little flat. I told the woman I was going to give her a chance at normal labor. She was somewhat disappointed but agreed. When I was called to the hospital the patient had already been taken to the confinement room and I did not have time to put on my gloves before she was delivered of her baby in a perfectly natural way.

DR. KEEFE, (closing).—I wish to lay stress on the importance of having some one man, endowed with a great deal of common sense, to correlate the findings of the various reports, laboratory reports and so on. Some one with surgical judgment should gather this information and then decide definitely what should be done to that particular patient. You should remember that three of the patients I reported were in three of perhaps the best clinics in this country. Not just ordinary surgeons operated, and if those things can occur among the highest type of surgeons in this country, what must occur with the great mass of surgeons?

OXYGEN IN THE PERITONEAL CAVITY, WITH REPORT OF CASES

By William Seaman Bainbridge, M.D., Sc.D., C.M., A.M.,
New York, N. Y.

If it seems necessary to offer an explanation of a paper on the intra-abdominal use of oxygen, at this time, may I say that my attention was recently redirected to the subject by a number of physicians who spoke of this method of using the gas as new in surgery. Besides a reawakened interest in the subject, because of the clearer concept resulting from the use of oxygen in war surgery, there is an added interest in the comparatively new use of oxygen in connection with radiography.

Doctors Stewart and Stein, in a recent number of the *Journal of Roentgenology,* describe the methods and results of introducing oxygen in the abdominal cavity "to make visible a number of organs, tumors and abdominal areas which heretofore have been more or less inaccessible to the Roentgen ray examination. The liver, spleen, and region of the gall bladder, pyloric end of the stomach, the wall of the stomach and large intestine with gas contents and the bladder filled with urine can all be distinctly outlined by gas inflation." The authors state "that the oxygen method is not a competitor of the opaque meal method, as the latter concerns the hollow organs, while oxygen inflation of the peritoneal cavity shows the solid structures but, in conjunction, the two methods are ideal and, when the oxygen method has been perfected to a greater degree, the gas inflation for an obscure condition may save many patients exploratory laparotomies."

During the years 1908, 1909, and 1913, I published three articles on the intraabdominal use of oxygen. The first paper was written with the purpose of stimulating interest in the subject, reviewing the literature, reporting illustrative cases and mapping out fields for further investigation. In this paper were reported experiments made upon animals with the purpose of discovering the beneficial effects, as well as the possible dangers, of the introduction of oxygen in the abdominal cavity. The tests were conducted to determine the absorbability of oxygen when injected into the abdominal cavity; the effect upon blood pressure, pulse, respiration, degree of anesthesia and the time of recovery after the anesthetic was discontinued; to determine the danger point of intraabdominal pressure, as expressed by a fall in blood pressure, respiratory difficulty and cardiac failure and the effect of oxygen upon the formation of adhesions. Although I reported many

of these experiments upon animals in my earlier paper, a brief résumé of the purpose and results of the experiments, in which I was assisted by Dr. Harold D. Meeker and Dr. James T. Gwathmey, may prove of interest at this time.

In the experiments to determine the absorbability of oxygen, when injected into the abdomen of a cat, the following technic was employed: a cat was anesthetized, the abdomen shaved, and a small incision made down to the peritoneum. A small trocar was introduced through this tissue at a sharp angle, while the peritoneum was lifted away from the intestines. The trocar was secured by a purse string suture of silk. The arrangement of the apparatus made it possible to determine the amount, the temperature and pressure of the oxygen used. The gas was introduced at a temperature of 38° C. A number of animals were distended with 200 c.c. of oxygen at 60 mm. water pressure, others with 300 c.c. at 100 mm. pressure and still others with 400 c.c. at 200 mm. pressure. After withdrawal of the trocar and closure of the wound, the cat was partly immersed in a jar of water to determine possible leakage. The animal was observed at frequent intervals and apparent reduction in the size of the abdomen noted. When the abdominal girth approximated the normal, the cat was again anesthetized, the abdomen punctured under water, and any gas bubbles expressed were collected and measured. Summary: the oxygen was completely absorbed in all cases left undisturbed thirty-six hours. In six of the cases no trace of the gas could be found after twenty-four hours, and in two none after eighteen hours. The increased intraabdominal pressure had but little influence in hastening the process of absorption.

In the second series of experiments the effect of the intraabdominal introduction of oxygen was noted upon the following: (1) blood pressure, (2) pulse, (3) respiration, (4) degree of anesthesia, (5) time of recovery after the anesthetic was discontinued.

A cat was anesthetized, a carotid artery exposed, and connected in the usual manner with a mercurial manometer and kymograph. The oxygen was introduced into the abdomen in the manner described above. The following observations were made: (1) a slight increase in pulse rate. This was probably due to a certain amount of oxygen reaching the heart and stimulating the process which causes contraction of the heart muscle. (2) A slight increase in respiration, probably due to a stimulation of the respiratory center, dependent upon an increased production of carbon dioxide. (3) A slight rise in blood pressure, which returned to normal in two or three minutes. The rise was due to pressure on the splanchnic vessels, thus assisting the venous flow to the right heart, and obstructing the arterial flow. The return to normal was probably due to a compensatory dilatation of other ves-

sels and to diminished diaphragmatic excursions which would cause a lessened amount of blood to flow from right to left heart through less distended lung tissue. (4) In all cases the immediate effect upon the degree of anesthesia was marked, the animal showing a tendency to come out from under the anesthetic almost immediately. In cases where the anesthesia was profound, reflexes quickly became active. (5) Animals into which oxygen had been introduced were able to stand in two to ten minutes after discontinuance of the anesthetic.

In the third series of experiments a number of cats were distended with air, the same technic, quantity and pressure of gas being used as in the oxygen experiments, the object being to effect a comparison with the second series of experiments with regard to the points in question. The effect on the pulse and respiratory rate was less marked, the blood pressure showed essentially the same result as in the second series. The influence of the introduction of air upon the degree of anesthesia was practically nil. The time of recovery from the anesthetic after it was discontinued was from fifteen to twenty-five minutes.

In the fourth series of experiments a number of animals were distended with oxygen under high pressure in order to determine the danger point of intraabdominal pressure, as manifested by a full blood pressure, respiratory embarrassment and cardiac failure. The gas was introduced in the same manner as in the previous experiments, but the pressure measured by a mercurial manometer. The pressure was raised to the equivalent of 1,500 to 1,800 mm. of water, and in all cases the abdomen was exceedingly tense, so that it was scarcely possible to make any indentation with the finger tip. It was observed that the blood pressure rose steadily until the intraabdominal pressure reached a point varying between 1,500 and 1,800 mm. of water, when it suddenly dropped. The heart action became more rapid and less regular and respiratory embarrassment primarily, and cardiac failure, secondly, caused death in a short time. Autopsy revealed no microscopic damage to the viscera. The effect on the animal of the high intraabdominal pressure demonstrated that the danger from the mechanical pressure of the gas may be practically disregarded. There was but slight rise in blood pressure, and no marked respiratory or cardiac disturbance until the pressure became extreme, i.e., reached a degree far in excess of that to which any human abdomen would likely be subjected either by accident or intention. In any case the respiratory embarrassment would give warning of the approach of a danger point.

In the fifth series of experiments the object was to determine the effect of the intraabdominal introduction of oxygen upon the formation of adhesions. Abdominal section was performed in a number of cats. In some the parietal and visceral peritoneum was scarified, the

abdomen moderately distended with 200 to 300 c.c. of oxygen, according to the size of the animal, and the wound closed. In others the same operative procedure was performed but no oxygen introduced into the abdomen. In still other animals, in order to make the approximation of the scarified surfaces a certainty, a portion of small intestine three inches long was anchored to the transverse colon by two silk sutures. The approximated surfaces between the sutures were generously scarified, the abdominal cavity distended with oxygen, and the wound closed. This procedure was repeated on other animals and the wound closed without the introduction of oxygen. The animals used in this series were left for two and four days respectively. The contrast observed on autopsy between the cats in which oxygen had been used and those in which no gas had been injected was striking. Of the six treated with oxygen, two had a few cobweb adhesions close to the anchoring sutures, one had a few fine adhesions between approximated intestines; all other cases were free from adhesions of any sort. In every instance, however, where oxygen was not employed, abundant adhesions were found, both intervisceral and parieto-visceral. The difference between the adhesions found on the animals autopsied on the second and those autopsied on the fourth day was one of density rather than number.

The deductions would seem to be: (1) that the oxygen mechanically held the scarified surfaces apart until new cells were formed; (2) that the oxygen increased the activity of the individual cells, thus hastening a new growth of epithelium to replace the destroyed peritoneal cells, the denuded areas being thus covered over; (3) that the increased peristalsis caused by the oxygen was unfavorable to the production of adhesions.

In addition to the observations already recorded, a striking change in the color of the blood was noticed upon the introduction of oxygen into the abdominal cavity of cats intentionally put into a state of partial asphyxia. The dark blood quickly changed to scarlet. It was also observed that intestinal peristalsis was increased by the atmosphere of oxygen. In no case was there microscopic evidence that oxygen was an irritant to the peritoneum or any of the abdominal viscera.

From the above experiments one may deduct the following: (1) Oxygen is completely absorbed in the abdominal cavity. (2) It is a slight respiratory stimulant. (3) It is a slight cardiac stimulant. (4) It has but little effect upon blood pressure when the pressure of the gas is moderate. (5) It tends to bring an animal quickly from deep anesthesia. (6) It hastens the recovery of an animal after discontinuance of the anesthesia. (7) A pressure of more than 1,500 mm. of water may cause collapse. (8) Oxygen tends to prevent the formation of

adhesions. (9) It quickly changes a dark blood to scarlet in cases of anoxemia. (10) It stimulates the intestinal peristalsis. (11) It is not an irritant to the peritoneum or the abdominal viscera.

After many months of experimentation upon animals, I introduced oxygen into the peritoneal cavity, following laparotomies on patients. So far as I was able to learn at the time of publishing my earlier papers on oxygen, the gas had not been introduced and allowed to remain *in situ* until absorbed, previous to my own experiments in this line, though Thiriar and others had employed the gas in a continuous stream for flushing out the abdominal cavity after laparotomies and after evacuations of ascitic fluid in tuberculous peritonitis.

In more than two hundred and fifty laparotomies, I have used oxygen in the peritoneal cavity with uniformly favorable results. The method has been to balloon the abdomen with pure gas (94.3-97. per cent oxygen) at a temperature of from 90-100 degrees F., close the wound and allow the tissues to absorb the oxygen. In conditions of abdominal distention with ascitic fluid, in certain forms of tuberculous peritonitis, and in some cases where large tumors were removed, the gas was introduced to the point of distention caused by the fluid or tumor.

The following cases are reported to illustrate the action of oxygen in the abdominal cavity.

1. C. V., age thirty-nine, married. This patient consulted me January 12, 1904. She was anemic, had intestinal indigestion, prolapsed and cystic ovaries and chronic appendicitis. May 20, 1904, the right ovary, tube and appendix were removed. Many tuberculous nodules were found, especially on the broad ligament and left ovary. Immediately following the abdominal introduction of oxygen, the blood became of brighter color, and the pulse and respiration distinctly improved. The oxygen was absorbed in thirty-six hours. The pathological report was: "Follicular ovarian cyst; acute miliary tuberculosis of the peritoneum covering the ovary and appendix." September, 1921, the patient was reported well and strong and with no evidence of tuberculosis.

2. B. L., age thirty, single. Admitted to the hospital suffering from diffuse tuberculous peritonitis, cystic ovaries and chronic appendicitis. Operation was performed April 20, 1906, and included curettage, removal of the appendix, right ovary and portions of the left ovary. There was considerable cyanosis present, which disappeared upon the introduction of oxygen into the peritoneal cavity. The pulse immediately became stronger, respiration deeper and the patient's condition greatly improved. In forty-eight hours there was no evidence of the presence of the oxygen. The intraabdominal administration of the gas unquestionably had a distinct tonic effect in this case. A letter from the patient, June, 1921, states that there has been no return of the tuberculous condition.

3. J. H., age twelve, male. This patient was operated on April 8, 1919. The boy was greatly emaciated. Marked tuberculous peritonitis and considerable fluid were found in the abdominal cavity. The small intestines were matted together with adhesions and were separated with great difficulty. When the adhesions were freed, the intestine for more than four feet was denuded of all peritoneum—leaving a raw, bleeding surface. The appendix was removed and the abdomen dis-

tended with oxygen and closed. September 12, 1921 the mother of the boy reports that the lad weighs 140 pounds, gain of thirty-five pounds, and is absolutely well.

4. W. E., age sixty-eight, female. I was called in consultation, April 14, 1908, for patient suffering with abdominal carcinosis and kinking of the intestine, with obstruction. The case was so extreme that operative procedure was warrantable only upon the ground of attempting to control the vomiting which was persistent and almost fecal in character. A large amount of fluid was removed from the abdomen and an attempt made to straighten the kinked gut. The patient was practically pulseless. The intraabdominal administration of oxygen was followed by prompt improvement in pulse, respiration and general condition. The patient rallied from shock, vomiting ceased, and she did as well as could be expected as long as the oxygen remained in the abdomen, but when the gas was all absorbed, she succumbed from asthenia four days after the operation. In this case the supporting effect of the oxygen was remarkable.

5. M. B., age twenty-nine, single. Patient was operated on November 6, 1908, for fibroid tumors of the uterus, cystic ovaries, chronic appendix and tuberculous peritonitis. Following this operation, warm oxygen was introduced into the abdomen, and the wound closed. A second operation was performed July 18, 1912, for intestinal stasis. The small intestine, for about two feet from the junction with the large, was kinked at an acute angle, and fastened against the abdominal wall. After eliminating the kinks and suturing the intestine, a careful search was made for evidence of tuberculosis, of which not the slightest trace was found, not even the retroperitoneal glands being enlarged. The large intestine showed no ulceration, proving that the patient had been completely cured of the intestinal tuberculosis.

6. M. O., age fifty-three, married. At operation, November 18, 1908, this patient's right ovary was found to be the seat of a very large cyst which had become adherent to the stomach and other viscera in the upper abdomen. There were multiple uterine fibromata. Panhysterectomy was performed, only the tip of the cervix being left. The entire mass weighed sixty-one (61) pounds. Several pints of ascitic fluid were evacuated from the peritoneal cavity. Shock was very great. Oxygen was introduced until the abdomen was ballooned to very nearly its size previous to operation. The patient's condition immediately improved. During the entire time the oxygen remained in the abdomen, between thirteen and fourteen days, the face was somewhat flushed, the lips more than ordinarily moist and red. There was no nausea, no vomiting, and no paralysis of the intestine in spite of the previous intraabdominal pressure. The patient's recovery was uneventful and in 1920 she was alive and well.

In surgical shock, blood transfusion, intravenous injection of gum arabic, oxygen inhalation and oxygen per enema are methods now in use. Air is occasionally employed to secure intraabdominal pressure but the pulse and respiration do not react as quickly under air as under pure oxygen. Saline solution introduced into the abdomen and hypodermoclysis are both stimulants for respiration. However, the saline solution is very quickly absorbed and is but a temporary stimulant, often followed by a greater fall in blood pressure.

In the World War the subject of shock was very much to the fore and various theories as to its primary cause were advanced. Crile's deduction is that of adrenal and nerve exhaustion. Cannon's expla-

nation—an accumulation and stagnation of blood in the capillaries, so that the blood is removed from currency—and Bayliss' theory of lack of adequate blood supply at the vital organs and nerve centers, are factors, doubtless, in the causation of surgical shock.

In the last analysis, however, shock probably is a multiplex condition and, among other causes, it seems evident that it may be produced by an engorgement of the blood vessels, especially in the abdomen, either from the removal of a large tumor or the withdrawal of a considerable amount of fluid. Years ago, surgeons realized the importance of supporting the organs of the abdomen, the vessels, etc., after operations for abdominal tumors. McBurney, following severe laparotomies, strapped the abdomens of his patients with bath towels to keep, as he said, the blood from centering in this region. Of course, we know now that, for obvious reasons, this procedure did not accomplish the desired result but the idea had a very important and far-reaching inference.

The introduction of oxygen in the peritoneal cavity, after the removal of a large abdominal tumor or a considerable amount of fluid, permits the abdominal viscera to resume their normal positions gradually. Without this oxygen pressure, or its equivalent, collapse of the organs usually follows the removal of the mass. The walls of the vessels are accustomed to the intraabdominal pressure and, when the support is removed, the walls become flabby and give way quickly. Any method which produces postoperative intraabdominal pressure lessens the engorgement, prevents dilation and a resulting tendency to paralysis of the vessels of the splanchnic viscera. Therefore, it would seem evident that when oxygen is introduced into the peritoneal cavity after operation, it is an agent of distinct value in *prevention* of shock or in the *treatment* of shock when such a condition exists.

Clinically, oxygen has been utilized in innumerable ways. As early as 1799 Beddoes employed oxygen for the cure of ulcers of a "mauvaise" nature. In 1861 Maniere and Gimbernat used injections of sterilized air in the treatment of hydrocele, and Marcane and Demarquay, in 1865, announced the cure by oxygen injection of a case of senile gangrene. Other authors cite the local use of the gas in furuncles, renal fistulas and psoas abscesses.

In an earlier paper, June, 1909, I reported cases of tuberculous ulceration of the intestine, tuberculous peritonitis and other infective processes cured by oxygen injection.

In cirrhosis of the liver, with ascites, where frequent withdrawal of the fluid was necessary, I found that the intraabdominal introduction of oxygen often increased the length of the intervals between the necessary tappings. The patient himself frequently mentioned the tonic effect of the oxygen. In flabby abdomens, where extensive operative manipulation had taken place, or where there had been great abdom-

inal pressure from a large tumor or considerable fluid, the introduction of the oxygen, with the mechanical supporting effect of the gas, seemed to act as a distinct factor in the prevention of ileus.

The beneficial influence of oxygen inhalation upon the digestive system is fully recognized and its bactericidal and antiseptic properties are conceded. However, from the results already secured, it is evident that there are still unrecognized therapeutic uses for the gas and a large field for further intensive research where the clinical and surgical possibilities of oxygen are to be considered.

DISCUSSION

DR. A. J. RONGY, NEW YORK CITY.—My experience with the introduction of oxygen into the peritoneal cavity is practically limited to a study of the patency of the fallopian tubes. When Dr. Bainbridge began the study of oxygen he had no way of measuring accurately the quantity he had introduced into the abdominal cavity. Now we have instruments by which we can accurately measure the quantity used. Not a great deal of oxygen need be introduced into the abdominal cavity to cause pain. A column of oxygen forms between the liver and the diaphragm as soon as the patient assumes an erect position which causes painful pressure on the diaphragm. One of my patients went into syncope on the table. It is safer to use carbon dioxide on account of its rapid absorption. It takes twenty-four to forty-eight hours for oxygen to be absorbed and during that time the patients have a great deal of pain in the abdomen and also in the right shoulder. They feel as they usually express it, that "they are almost paralyzed on the right side."

DR. STEPHEN E. TRACY, PHILADELPHIA, PENN.—I would like to know whether Dr. Bainbridge obtains better results with the use of oxygen in his cases of tuberculosis of the peritoneum than he did in cases not treated with oxygen. My experience has been that if the source of infection is removed and the abdomen closed the results are good. We have used oxygen in the treatment of tuberculous sinuses, and it seemed that they healed in a much shorter time than those treated by other methods.

DR. H. J. SCHERCK, ST. LOUIS, MISSOURI.—I wish to say a few words on the question of pneumoperitoneum, not so much from a therapeutic as a diagnostic standpoint. I would like to say that the technic worked out by me and my associates has served to make the diagnosis between intraabdominal and extraperitoneal tumors perfectly clear without exception. The method is very simple. A large block of wood is placed under the thorax and underneath the pelvis, allowing the abdominal contents to sag, and after this the abdomen is distended, using air. Oxygen is introduced under pressure from the tanks and we produce our own pressure. If a tumor is situated retroperitoneally the clear prevertebral space can be seen impinged upon by the tumor mass, and you can make a diagnosis at once between the intraabdominal and retroperitoneal growths.

I have not observed in our series a single alarming symptom. I have noticed the pain in the shoulder referred to by the last speaker. We did have a certain amount of emphysema following but since we have adopted a little apparatus designed by Dr. Sante placing between the tube and the needle, a manometer from an ordinary blood pressure apparatus, we can determine whether the needle is in the

abdominal cavity or in the gut or tissue. If pressure is registered we know we are up against an obstruction.

There was another experiment of particular interest to me and that was some other work that we have been doing in reference to fluoroscopy in conjunction with the pneumoperitoneum and the injection of the ureters and pelvis of the kidney. We have introduced 15 to 25 per cent bromide of soda when the pneumoperitoneum was made. We get a much better view in that way than without the distention of the abdomen. I think we were the first to suggest this. If the air in the abdomen is in the way it is easy to remove it before the patient is put back to bed by leaving the needle in and simply pressing it out.

We had a type of case not mentioned by the essayist, an intraabdominal hemorrhage due to traumatism. In this case we were unable to tell whether or not there was a rupture of the gut. So we took a picture to determine whether there was a rupture, believing that there would be enough gas admitted into the abdomen from the bowel to show whether the gut had been ruptured. In this case there was enough gas to determine this point. In the next case we found no pneumoperitoneum and upon laparotomy found a rupture of the kidney and then after operating on the case we distended the abdomen with air in order to sustain intraabdominal pressure. As soon as the intraabdominal pressure is reduced, the hemorrhage will start again in many of these cases.

DR. BAINBRIDGE, (closing).—Dr. Rongy has had experience with the adulteration of oxygen. I, too, have spent much time in testing the quality of oxygen on the market. We must be just as careful in regard to the purity of the oxygen we use as we are with digitalis, atropin, or any other drug.

I have not had the experience mentioned by Dr. Rongy in regard to syncope and invalidism. In my reports on this subject, the first one published in 1908, you will find that very few patients have any annoying effects whatever from this procedure. One woman I tapped 134 times and usually introduced oxygen into the peritoneal cavity, at her request. After a few hours she was always able to return to her work as Probation Officer in a suburb of New York. I have had scores of cases markedly benefited through this means. I believe we have here a therapeutic agent in selected cases.

Dr. Tracy has spoken of tuberculous peritonitis; I think oxygen is just another element of help. We have all seen these cases get well with only a laparotomy.

The point about hemorrhage is a very good one, and you will find that in my paper published in 1908 I speak of the prevention of secondary hemorrhage by the pressure of the volume of gas.

TRANSPERITONEAL NEPHROPEXY

By Thomas B. Noble, M.D., Indianapolis, Ind.

THE normal position and relationship of the abdominal viscera depend, primarily, upon the integrity of the abdominal wall. Of secondary importance is to be considered their ligamentous attachments and their variations in specific gravity. All the abdominal viscera float more or less freely within a cavity having a fixed and rigid back and base, with a highly elastic cap, sides, and front.

Through their ligamentous attachments must, naturally, come their blood and nerve supply. The solid viscera are rather firmly attached by short supports in fixed localities, while the hollow viscera with much longer supports have a more indefinite topography or position. It is obvious then that anything which tends to disturb the normal position of any one of the abdominal organs will have a distorting influence on all the others. And as a physical proposition those organs of shortest attachments will be, naturally, the first to have nerve irritation and to present symptoms. It is a logical sequence then that, among the first viscera to cry out against the disturbing features of visceroptosis, is the kidney. The right one is most frequently involved. This occurs more often in women than in men. Men rarely have it.

We have in common use the terms, movable or palpable; motile or hypermotile; floating or wandering kidneys; all of which refer to the degree of motility but bear no relationship to symptoms. They serve their purpose in nomenclature, but aid us little in practical therapeutics.

Subjective symptoms are not in accord with the degree of mobility or displacement. Some cases of slight distortion have many symptoms while others of great displacement have none. There is nothing pathognomonic of this condition. Objective signs may be confused with pathologic processes of the gall bladder, stomach, duodenum, colon—including the appendix and teratomata. While subjective symptoms may be associated with most everything. All sorts of secretory, sensory and motor disturbances of the gastrointestinal tract, disturbances of circulation and urinary output, pelvic symptoms, headache, vertigo, general exhaustion with dragging pains in the loins are a few of the many symptoms associated with this disease. And while they may be properly associated with this disease, many of them may be just as properly associated with other pathologic conditions in and near to this region.

No operative treatment, therefore, should be undertaken without a most careful and painstaking investigation, and should be made with

an incision which gives the widest field for observation and pathologic differentiation. Such an incision is logically in front and not in the back. As a result of unsatisfactory experiences with the lumbar incision I abandoned it fifteen years ago, and during these years have confined myself wholly to a method which may be described as follows:

Open the abdomen by an incision a fingerbreadth below the costal border, extending from the median line to near the tip of last rib. Elevate the liver and gall bladder by means of a broad retractor in the hands of the first assistant, while the second assistant with a gauze pad introduced into the abdomen holds downward and inward the hepatic flexor of the colon. Proper traction by the two assistants makes taut the peritoneal reflection lying in front of the kidney and brings it well into view. The peritoneum overlying the kidney is now incised for the distance of about four inches. Through this incision the hand is introduced around the fatty capsule and after free dissection, the kidney and its capsule are lifted outside of the abdominal wound. Looking into the bed from which it has been removed, there will be seen some loose areolar tissue lying upon the reflection of the diaphragm, the transverse fascia and the quadratus lumborum muscle. With a pledget of gauze in the jaws of forceps, this should be wiped well away from these structures, so that the fascia is perfectly clean. If this be carefully done no hemorrhage or oozing will occur and the pocket which the kidney is to occupy will be dry.

Turning now to the kidney itself which lies outside of the abdominal wound, the fatty capsule is completely removed from its posterior aspect, exposing the fibrous capsule underneath. Hemorrhage may occur from a few small vessels which should be carefully ligated.

Next, incise the fibrous capsule from the upper to the lower pole carrying the incision close to the hilum. Separate now, the fibrous capsule from the kidney substance, denuding the entire posterior aspect of the kidney of its fibrous capsule so making a fibrous flap everywhere free except at its base, where it still remains attached to the major curvature or convex surface of the kidney. Care should be exercised in removing the fibrous capsule lest wounding of the kidney substance and troublesome oozing occur.

A suture of No. 2 chromic catgut 20 inches in length is now carried through the upper end of the flap of fibrous capsule which still remains outside of the abdomen and is next caught in the fascia transversalis or quadratus lumborum high up in the bed from which the kidney has been removed.

A second suture of the same character is likewise introduced through the lower end of the fibrous capsule and carried down and made to catch up a second portion of the fascia or the quadratus muscle in the lower aspect of the cavity. A third suture is again introduced

through the same structures but midway between the two former sutures. Clamps are attached to either end of these sutures as they are introduced.

The kidney is now restored to its normal position by being dropped back into the abdomen through the incision in the posterior peritoneal reflection. Clamps are removed from the ends of the sutures and they are securely tied. Thus the kidney is suspended with its denuded posterior aspect lying against the quadratus lumborum muscle to which it has been attached by three sutures through a flap of its fibrous capsule. Under the eye of the operator it has been restored to its normal position with no distortion of its blood and nerve supply and with a free ureteral drainage.

A running suture of plain catgut next closes the wound in the peritoneum overlying the kidney. The edges of this wound should be turned in so as to prevent the formation of adhesions. The abdominal wound may be closed in the usual manner.

I have been fixing the kidney by this method for fifteen years. I have had no case return to me with failure. In two cases infection necessitated drainage for a time. Two cases were relieved who had been operated by the lumbar route with low fixation and increase of symptoms.

I feel warranted in recommending this operation: 1. Because it establishes regional and general abdominal diagnosis. 2. Because through its primary incision much other work can be done on other abdominal viscera, if necessary. 3. Because it permits the operator to place the kidney where it belongs. 4. Because the lapse of time since its inauguration has been sufficient to prove its value.

DISCUSSION

DR. ROLAND E. SKEEL, LOS ANGELES, CALIF.—In the discussion on radium yesterday the essayist observed that we were discussing something which would be obsolete in a few years; but he now has given us the technic of an operation which so rarely ought to be performed that it should have been obsolete for the past ten or fifteen years. Leaving aside the few patients with recurrent or persistent hydronephrosis, which we consider to be definitely surgical, why do a nephropexy on anyone?

Quadrupeds do not have movable or floating kidneys, but bipeds do; and the most beautiful illustration of useless surgery is that employed to fix a kidney in which the principal symptom is pain without evidence of retention of urine in the kidney pelvis. These patients are all physically inadequate and consequently neurasthenic and if one relieves the patient from a pain in one side, she develops pain in the other or in the back of her neck or elsewhere. Moreover, if consistent with life you might remove all the organs in the abdomen and the patient would still complain because the origin of her symptoms is in the central nervous system.

DR. K. ISADORE SANES, PITTSBURGH, PA.—Pyelography has demonstrated to us cases of prolapsed kidney that are pathological. We have seen cases of nephroptosis with such kinks and angulations, at times fixed by adhesions, that the flow of

urine was greatly interfered with, causing a hydronephrosis and pyonephrosis. There is no question that there are cases which require surgical interference.

As to the operation suggested by the essayist, if I were to operate primarily for nephroptosis I would unquestionably choose the posterior route, but if, during an abdominal operation, with a sufficiently large incision, I had to do a nephropexy in addition, I think I would consider favorably the operation suggested by the author.

DR. C. W. MOOTS, TOLEDO, OHIO.—I would like to go a step further than Dr. Skeel and say that we should never operate for pain *per se*.

DR. MILES F. PORTER, FORT WAYNE, INDIANA.—"Never" and "always" are very strong words. Never operate for pain? God forbid that I should ever find it necessary to consult that surgeon with a neuritis of the fifth nerve! Yes, we operate for pain!

DR. NOBLE, (closing).—The matter of displaced kidney is one that men have debated for years, as well as other visceroptoses, and because of the failure in many cases, discouragement has come to many, and certain operators have therefore quit working on the kidneys and allowed the patients to go on and suffer pain. They have approached the kidney through the back, which I believe is the wrong route.

Clinical progress and conversation with your confreres prove the statement that I make. This very day one of our Fellows told me of an experience which I am privileged to quote. Recently a patient was operated through the back for a floating kidney, followed by recurrence. Again operated in the back, and again followed by recurrence. This confrere then took the case, operated once more through the back, and again, recurrence. Then he operated through the abdomen to take the kidney out and found the patient had a pathological gall bladder to be taken care of. Another reason why we should go into the abdomen; we may find something else and thus make our patient well.

A few days ago, I saw a woman who had been cut in the back, with urinary drainage for months and months. There was a picture of renal stones in that kidney. She had been cut in the back but the renal fistulae continued and a subsequent picture showed a plugging of the ureter from another stone. I found her with a discouraged operator, and stone on the other side. She was turned over to me. But I said: "If I do it I will do it my way. I will save the right kidney, if possible, and do with the left what I have to do." With a cut in front I found out (she was a fat woman and we could not make this discovery before) that she had a big, thick gall bladder plugged up with a stone exactly the size of the shadow on the right side. One would think at once, here is the solution of the trouble. I felt quite elated that I had gone in, for this was the pathological lesion. I removed the gall bladder and the stone. I was unable to palpate anything through the fat about her kidney and hoped I had removed the source of her trouble, but a photograph showed the same shadow. Four weeks later through the same incision, I removed the stone in the right kidney. She has yet to undergo a fourth operation for the trouble in the left side.

Among many of the cases, we find that to cure the patient we have to take care of the pyloric disease, of the accessory artery in the lower pole of the kidney, the head of the colon; we have to do with other pathology as well as that of the kidney, and through such an incision I maintain that I can do my patient more service than I can through the back.

COINCIDENT RUPTURED ECTOPIC GESTATION AND ACUTE SUPPURATIVE APPENDICITIS

By Charles E. Ruth, M.D., F.A.C.S., Des Moines, Iowa

Cases such as this are rare enough to be well worth reporting, presenting difficulties too, in diagnosis, which makes them interesting. In over thirty years of dealing with these conditions I have never before seen them occur coincidently, so consider myself fortunate in making the diagnosis before operation.

The patient, Mrs. S., twenty-three years old, family history negative and general health good. She aborted in the summer of 1920, but recovered without incident. In October she menstruated normally but failed to menstruate at all in November. On December 7, she had an apparent attack of appendicitis accompanied by a slight menstrual flow, from which she recovered sufficiently to be about and at her work in three days.

Jan. 8 she was again taken suddenly ill. Her family physician, Dr. R. Fred Throckmorton, was called at two in the morning. She was in profound shock, pale, nearly pulseless, abdomen tender, rigid and distended with gas. Ordered to the hospital immediately, she did not arrive until late afternoon.

At ten in the evening of the same day her pulse, still weak, was markedly improved. She was no longer in severe shock. At this time her temperature was 101° F. Leucocytes 17,000. Pain, still severe, was more marked on the right side, as were also tenderness on pressure and muscular rigidity. Behind the uterus a mass filled the pelvic cavity.

Presumptive diagnosis of ruptured tubal pregnancy and acute appendicitis was made. Operation was postponed until morning, improvement from the shock seeming to indicate that hemorrhage had ceased and that further improvement was likely. Improvement did continue during the night so that she reached the operating room at eight o'clock in very fair condition.

Median incision below the umbilicus revealed the upper abdomen filled with pus, the lower abdomen and pelvis containing a large amount of partly coagulated blood. The right fallopian tube was found to be ruptured. It contained a placenta with attached cord and a three inch fetus. The tube was ligated, removed, and the stump covered with peritoneum. The pus in the upper abdomen came from a retrocecal appendix which was covered with a thin film of exudate. There seemed to be no attempt at limitation of the infection by adhesions of omentum or intestinal loops. The stump of the appendix was too thick and brittle to be ligated, but was inverted by suture. One large drainage tube was placed in the culdesac of Douglas and another behind the cecum.

The operation was concluded with as great speed and little exposure and trauma of tissue as possible. Postoperative condition fair. The patient was kept in a sitting position well inclined to the right. Proctoclysis was continuous. The wicking in the drainage tubes was removed at the end of twenty-four hours. Recovery was complete in four weeks at which time she was up and feeling well.

It is not always easy to decide in cases such as this, whether to operate immediately or wait until conditions are a little more favorable. I do not like to operate at night. I feel that I do better work in the day time. Except in cases where it is quite apparent that the progress of the case is backward and delay dangerous, I prefer to wait until morning.

In this case we did the proper thing for she rallied from the shock and came to the operation in better shape than she would have the night before. And yet there was always the possibility that hemorrhage would recur or that she might have by morning absorbed enough of the toxins from the appendix to be beyond help. The latter danger we decreased by keeping her on her right side with the shoulders elevated, throughout the night. The danger from hemorrhage was lessened by limiting her movements with morphine and placing of an ice pack on the lower abdomen. The constant improvement during the night was not an absolute indication that we were safe. A hemorrhage might have occurred at any moment.

Twenty years ago suppurating appendicitis with diffuse peritonitis resulted in a mortality of about 90 per cent. Now 10 per cent is not expected, other complicating factors, such as we had in the case reported, being absent. The principal factors in reducing the former great mortality are, I think, five: (1) shorter time of operation; (2) continuous proctoclysis to supply the needed body fluid while the stomach is irritable; (3) Fowler position to aid drainage and prevent infection from gaining contact with the open mouthed lymphatics of the upper abdomen; (4) less trauma from atmospheric exposure, manual manipulation and contact of peritoneal surfaces with dry gauze; and (5) well placed, large drains.

DISCUSSION

DR. STEPHEN E. TRACY, PHILADELPHIA, PENN.—Some years ago I saw a patient with a somewhat similar history, whom the family physician had treated for an acute attack of appendicitis. The patient had apparently recovered and the doctor had discharged himself. The following morning the patient was seized with violent abdominal pain. When the doctor arrived he found her in a state of collapse with marked tenderness over all the abdomen. She was sent to the hospital and the resident physician reported, that from the history, he thought she had a ruptured ectopic gestation. When I saw her later in the morning she had reacted and was in a fair condition, and an immediate operation was decided upon. The pelvis and lower abdomen contained a considerable quantity of liquid and clotted blood from a ruptured left tubal gestation. The appendix was retrocecal, acutely inflamed and filled with pus. The left fallopian tube and the appendix were removed and the patient had a normal convalescence.

THE ICE BAG IN APPENDICITIS—A FETICH

By Charles W. Moots, M.D., F.A.C.S., Toledo, Ohio

AN EXCUSE for presenting to this Association a brief discussion of a subject of a purely practical nature exists in the fact that my own experience is, probably, only a reflection of the total experience of the membership of the Association.

Ever since the day that someone placed an ice bag over a grumbling appendix vermiformis, and found that the patient complained less of pain and soon recovered from the attack, there has gradually arisen among the profession and laity, the belief that this method was curing appendicitis. Each of us has heard, over and over again, this statement from patients who present the symptom complex so vividly described by Murphy: "I've had two previous attacks and Dr. Jones froze it out both times." Nothing could be further from the truth. You and I know very well, as any scientifically trained man must know if he thinks at all, that it is foolish to presume that it is possible during life to reduce the temperature in the lumen of an appendix that is frequently deep in the peritoneal cavity to a point which will stop the activity or development of the numerous microorganisms found within an appendix. Neither will it prevent, but rather hasten, the development of gangrene which comes as a result of mechanical interference with the circulation of this organ. All that anyone should expect from the application of this treatment, or abuse, as one may select to term it, is, that the endings of the sensory nerves will be rendered incompetent to transmit warnings, thus removing what the patient calls pain. All the while, it is the phagocytic action of the leucocytes which brings the appendix back to a normal condition in spite of the absence of the best equipment belonging to any fighting army, namely, warmth; or, as too often happens, the shivering army of leucocytes are wounded and destroyed by the advancing hordes of infectious bacteria, while the poor patient is painlessly slipping rapidly along toward a "life-saving operation" or beyond all help, with a feeling of false security in the freezing process. This is wrong, not only because it leads to a considerable number of unnecessary deaths and countless numbers of painful, long morbidities, but also because it is dishonest.

If the physician who sees these cases before or at the time a diagnosis can be made, would advise them that there is but one treatment which can possibly have any effect; that a very large percentage of cases may get well if they only go to bed and remain quiet, taking only liquids for nourishment; that early operation under proper con-

ditions means 100 per cent recoveries; that late operations involve a high mortality as well as a high morbidity rate; that morphine and the ice bag, especially the latter, have no favorable effect upon the course of the disease, but simply give some relief from the pain, thus only masking the symptoms; if he will do these things, bearing in mind the final injunctions of the shrill voiced teacher, "Every case of appendiceal abscess is absolute evidence that the case has been improperly handled up to the time of opening the abscess," our profession might escape impeachment upon the question of the treatment of appendicitis.

In justice to the entire profession, it is a pleasure to recall that the use of opiates is now confined to the period between the time of determining the diagnosis and the earliest possible operation. But, not so of the ice bag. There yet exists a too large number who apply the ice bag with an air of confidence in its ability to cure, never suggesting to the patient that it simply relieves pain. For this reason it is not so useful as opium since the latter not only relieves pain and gives general rest, but also immobilizes the intestines and thus, to a certain extent, applies splints to the appendix.

Should not the members of this Association become agents for the dissemination of truth concerning the ice bag in appendicitis to the end that the public may learn that it is merely pain-alleviating and should be used only with this function in mind while waiting for proper surgical procedures; and also, since opiates are, for this purpose, so much more effective, that the use of superficial refrigeration, as procured by the ice bag, is unwarranted during any stage of an appendiceal crisis?

DISCUSSION

DR. FREDERICK S. WETHERELL, SYRACUSE, N. Y.—Dr. Moots makes the statement that the ice bag on the abdomen has no effect on the growth of organisms in the appendix. He also makes the statement that the chance for gangrene is increased by interference with the circulation. I would like to have him explain how the cold gets down through the skin, the superficial fascia and muscles to the appendiceal branch of the ileocecal artery so as to change the circulation, without having any effect on the organisms.

DR. A. J. RONGY, NEW YORK CITY, N. Y.—In a series of experiments in cases with abdominal fistulae where the temperature was measured with ice bags on the top of the abdomen they had no effect on the internal viscera. What the ice bag does is to stop the pain by acting on the nerves of the skin. It does not change the temperature at all, and it cannot do it within the abdominal cavity.

DR. MOOTS, (closing).—In reply to Dr. Wetherell, I believe we agree entirely. I think it was bad rhetoric that permitted you to get the impression you did. I had in mind, when I wrote the sentence, to say that it did not do that much.

For twenty-six years I have been asked by many medical associations to take an active interest in legislation to protect the public from the so-called nonmedical cults. The object in writing this paper was to bring forcibly before you this fact, —that until our trained men will go home and do as well as they know, we have no right to ask legislation to protect the public.

TORSION OF APPENDICES EPIPLOICAE

By Benjamin Rush McClellan, M.D., F.A.C.S., Xenia, Ohio

THE cases herein reported have come under the writer's observation within the year just past, and have led to a search in current literature for reports of similar cases. The result of this brief study has led to the conclusion that they are not so rare as the literature would indicate, and that a more careful and routine examination of these neglected organs would uncover the cause of many cases of obscure and chronic invalidism.

In the *Annals of Surgery*, Harrigan, in October, 1917, and Hunt, in January, 1919, give very interesting and thorough reports of their experiences and investigations of this subject. So far as the writer has been able to ascertain, there have been no cases reported since those named above.

It has been said that the anatomy and physiology of the appendices epiploicae have received scant study by modern anatomists and physiologists as compared with their importance in the field of abdominal surgery. Harrigan estimates their average number as one hundred. Their size and form vary in different locations and in different individuals. They are usually arranged in two rows closely coinciding with the anterior and posterior inferior longitudinal bands of the colon. There may be but one row and, more rarely, there may be three rows. They are best developed on the transverse and pelvic colon, much smaller on the cecum, very small on the vermiform appendix and absent on the rectum. Their structure is not unlike that of the omentum which, no doubt, is the reason they have sometimes been called omentulae. Each one is supplied with a single artery, arising from the superior or inferior mesenteric. The venous blood empties into the superior or inferior mesenteric or renal veins. Some physiologists have suggested that, in function as well as in structure, they are in some degree like the omentum. However, Harrigan quotes Robinson as saying "that the appendices epiploicae, simple in structure and presenting no evidence of specialized function as indicated by a complex histology, act like the omentum, is extremely unlikely." Robinson is of the opinion, however, that the appendices epiploicae are concerned with the movements of fluid in the large intestine. He bases his belief on experiments made upon the cadaver. But Harrigan says this cannot be accepted as proved.

The pathology of the appendices epiploicae, which is of especial interest to abdominal surgeons, is an inflammation, acute or chronic,

caused by an interference with their blood supply, due to compression. twisting, or overstretching, which may or may not be accompanied by infection. By reason of their close relationship to the colon the bacteria, common in this region, are the most frequent source of infection. Harrigan says "if infection is absent, the inflammation becomes of academic interest." While it is true that twisting or compression, which completely shuts off their blood supply without infection taking place, may result in separation from their attachment to the colon and their subsequent existence as foreign bodies in the abdominal cavity; yet it is also true that the inflammation resulting may be subacute or chronic, and terminate in more or less morbidity and invalidism. To support this point of view the following cases are submitted.

CASE 1.—Mrs. F., age thirty-four; well nourished; multipara (13; family history good; no previous illnesses but those incident to childhood. During the last month of her thirteenth pregnancy, which terminated in May, 1920, she had two attacks of acute pain in the lower right quadrant of her abdomen which were diagnosed as acute appendicitis by her attending physician who, on account of her nearness to parturition, advised against operative intervention. During the last of these attacks, a very small lump was discovered in the region of the right femoral ring, but no importance was attached to it at this time. About five weeks after parturition the patient had an attack of pneumonia, which was complicated by a recurrence of the severe pain and tenderness in the right lower quadrant of the abdomen. The following August, the fourteenth pregnancy began. In September, after a tiresome motor trip, the patient had another severe attack of pain similar to the previous ones with the exception that at this time it radiated not only toward the epigastrium but into her right thigh. Rest in bed and cold applications relieved her of the acute symptoms, but she suffered with varying degrees of pain until December 5, 1920, when she had an especially threatening attack which sent her to the hospital for surgical intervention. The admitting diagnosis was irreducible right femoral hernia, and chronic recurrent appendicitis complicating pregnancy (fourth month).

Operation December 6; ether anesthesia; incision, lower right rectus; appendectomy; excision of appendix epiploica; removal of right femoral hernia sac and closure of same from within. The patient made prompt recovery. Operative findings: Uterus pregnant about four months; chronic inflammation of the vermiform appendix; an appendix epiploica arising from the anterior surface of the middle portion of the transverse colon was twisted and inflamed, completely filled, and was firmly adherent to the right femoral hernial sac. It was fully four and one-half inches long, which was twice the length of its fellows arising from the transverse colon.

Comment: The vermiform appendix presented abundant evidence of chronic inflammation, but it was very apparent that the incarcerated appendix epiploica was the principal cause of her more recent attacks of pain, and that these were provoked by the increased intraabdominal pressure due to her pregnancies, and were much exacerbated by the coughing incident to the pneumonia, as well as by her motor trip which was over rough roads and very tiresome. It is worth while to note that the fourteenth pregnancy was happily terminated on May 18 of this year, and that the mother, who has borne one child each year of the fourteen years of her married life, looks more like a woman of twenty-four than one of thirty-four.

CASE 2.—Mr. H. W., age sixty-nine; farmer; well nourished; besides childhood diseases he has had no other serious illness, but has had a left direct inguinal hernia for more than forty years, which necessitated the use of a truss. This very indifferently supported the relaxed inguinal outlet, and at times was the cause of much pain, compelling him to give up all strenuous work incident to his vocation. The constant sensation of something pulling or dragging in the inguinal region caused him to acquire the habit of stooping which, in recent years, grew very pronounced. His suffering became so severe that he entered the hospital August 21, 1921. The admitting diagnosis was incarcerated direct right inguinal hernia and hemorrhoids. Operation on August 22, 1921; novocaine anesthesia; herniotomy (Ferguson's technic); clamp and cautery treatment for hemorrhoids.

Comment: Firmly attached to the bottom of the hernial sac was an elongated appendix epiploica which was twisted fully 180°. Its fibrous structure was so much increased that it gave the impression of a diverticulum, and fat necrosis gave the sensation of fluid in a cyst. Two other appendices epiploicae were firmly wrapped around its proximal portion, much like the omentum so frequently found enveloping an inflamed appendix vermiformis for protection. It is interesting to note that Hunt records similar action on the part of appendices epiploicae in some cases of diverticulitis of the colon seen at the Mayo Clinic. The patient made a prompt recovery and was dismissed September 5. While it is too soon to say what the end result will be, the patient can now stand erect and without pain. It is fully expected that the cause of his suffering has been removed and that the torsion of the appendix epiploica had much to do with the dragging pain which caused him to become prematurely bent and aged.

Hunt, in his review of forty-two cases reported in the literature on this subject, to which he had added eleven cases occurring in the Mayo Clinic, making a total of fifty-three cases, classifies them as follows:

Appendices epiploicae as foreign bodies	12
Intraabdominal torsion of appendices epiploicae	16
Intrahernial torsion of appendices epiploicae	10
Intrahernial strangulation or incarceration of appendices epiploicae	14
Intestinal obstruction, due to appendices epiploicae,	1
	53

In the above noted 24 cases of appendices epiploicae found twisted and incarcerated in hernial sacs, 17 were in the left inguinal, 5 were in the right inguinal, and 2 were in the left femoral. Case No. 1 in this paper is, therefore, the first to be recorded as incarcerated in the right femoral sac.

In a series of forty cases in which mechanical interference with the blood supply had occurred, Hunt found the origin of the appendices epiploicae was 28 times in the sigmoid, 6 times in the cecum, in the transverse colon once, and unstated 5 times. Therefore my case, No. 1, is the second one to be recorded as having its origin in the transverse colon. Case No. 2 belongs to the most common group, namely, appendices epiploicae originating from the pelvic colon and incarcerated in the left inguinal canal.

I have been led to report these cases because of the conviction that not only are they less rare than the literature of the subject would indicate; but, also, that many cases of relievable morbidity will be found do to this cause. It is the writer's hope that abdominal surgeons will add this organ to the list of suspected sources of chronic as well as of acute intraabdominal diseases to be sought for as a matter of routine in all laparotomies when it is possible.

TRANSUTERINE INSUFFLATION, A DIAGNOSTIC AID IN STERILITY

By A. J. Rongy, M.D., F.A.C.S., and S. S. Rosenfeld, M.D.,
New York, N. Y.

IN a previous paper, I stated that the subject of sterility was not only important from a medical standpoint but also from a social aspect. I am now more than ever convinced that early environment and mode of living, especially in metropolitan districts, must be taken into consideration in our study of the subject. Our social structure, in recent years, has undergone great changes. It is a question whether the so-called "Woman's Equality Movement," now permeating the entire civilized world and, of necessity, bringing the adolescent girl into various industrial fields, is not having its deleterious effects; so that a great many girls, who are of an inferior constitutionality, do not develop properly; with the result that the entire cycle connected with menstruation and ovulation is, to a great extent, interfered with.

Every gynecologist who has been in active practice for a score or more years knows that, primary as well as secondary, sterility is constantly on the increase; and that, in the majority of instances, he is unable to relieve or cure the condition. The two years preceding August 1, 1921, I saw in my office 403 patients who consulted me because of their sterility. The male aspect was in every instance investigated either by us or through other laboratories, and I was pleased to find that sterility due to the husband is on the decrease. I believe that the educational campaigns, conducted by the medical profession and various Public Health Agencies, are now just beginning to bear fruit. The average intelligent young man has been, practically, frightened into the practice of continence before marriage and the result is that gonorrhea and all its complications are on the decrease. In previous years, in fully 25 per cent of cases of sterility, the cause could be ascribed to the male; now it is not more than 10 per cent.

In this paper I shall not attempt to discuss the general subject of sterility, or even make a complete study of the material at hand. I shall confine my remarks only to one phase of it and that is fallopian tube patency. And here I wish to state that the present practice followed by the profession at large, and also by some specialists in ascribing stenosis of the cervical os as a cause of sterility, is entirely fallacious in fully 95 per cent of cases and I am certain that not only do operations on the cervix fail to cure the patient, but, in a number of instances, cause mild and insidious infections which finally involve the tubes and the patients become permanently sterile. Dilatation and

curettage as practiced by the general practitioner; the stem pessary and cutting operations on the cervix, as practiced by the specialist, have cured very few patients. That this contention is true is proved by the fact that over 300 of my patients had cervical operations ranging in number from one to six. One of these patients had her cervix dilated four times by general practitioners, once a stem pessary operation by a specialist; not having been cured by these five operations she again consulted a gynecologist. He performed a Dudley operation on the cervix and she is still sterile. I have always held that, if a woman has a cervical canal sufficiently large to discharge the menstrual blood, the canal is roomy enough for a spermatozoon to pass through. In all but two cases I succeeded in introducing a fairly large cannula into the lumen of the uterus without any discomfort to the patient, proving that cervical stenosis is, usually, a myth and practically does not exist.

I believe that the time is ripe for the teachers in our medical colleges to point out to the future members of the profession the erroneous conception heretofore held regarding the mechanical aspect of sterility and, in that way only will be eliminated useless and obsolete operations which in a great many instances are a cause for permanent sterility. I maintain that in the few instances, where pregnancy followed such procedures, these patients would, eventually, have become pregnant even if they were not operated upon. Operations on the cervical canal without definite knowledge as to the condition of the fallopian tubes are obviously incomplete procedures. Heretofore we had no means by which we could definitely establish the patency of the tubes. All of us have realized that in a great number of patients the involvement was so slight, that no matter how skillful and astute the examiner was, that very often he was unable to detect these pathologic changes, and yet they were sufficient to cause complete closure or obstruction in the tubes.

The recent work of Stein and Stewart in this country, reawakening interest in peritoneal gas inflation, followed by Roentgen examination, has evidently stimulated Rubin of New York to adopt this procedure in order to study the patency of the fallopian tubes. To Rubin must be given the credit of really adding a new diagnostic point which is definite and certain if properly carried out and which is of great aid in our study of sterility. We feel that at present the treatment of sterility is incomplete unless the patient is examined for patency of the tubes. Unfortunately, however, there are a great number of cases whose fallopian tubes are patent and, notwithstanding treatment, remain sterile. These cases must be grouped under the heading of sterility of constitutional origin which may be temporary or permanent in nature. The menstrual history of the patient must be thor-

oughly studied as to time of onset, frequency, duration, and quantity of blood lost with each menstrual period. This, with the findings elicited by vaginal examination, will often help to decide whether the sterility is of a permanent or temporary nature.

In recent years to the glands of internal secretion have been ascribed marvelous curative properties in the treatment of sterility and menstrual disorders. The literature abounds with enthusiastic reports of the successful treatment of sterility by various combinations of glandular extracts. In my series of cases, the majority of patients have, from time to time, been treated by some of our most enthusiastic advocates of glandular therapy but still remained sterile. I have also attempted to treat these patients along the same lines and, with but few exceptions, the results were not good. Endocrinological treatment has its place in some of the milder menstrual disorders, but it certainly fails to cure the more severe types of menstrual disorders and is of little avail in the treatment of sterility. I make this statement advisedly; for the 403 women who have consulted me regarding their sterility have, from time to time, consulted many other gynecologists, some of whom practically limited their entire conception of human derangement to some endocrinologic disturbance and who have fed them on various combinations of gland extracts and still the women remained sterile. It seems to me that sterility is not caused by ovarian, thyroid or pituitary disturbance, but by that something which causes that disturbance in these various glands. In other words, glandular disturbance is a terminal condition and is only secondary in nature to some processes in the human economy which alter the normal physiologic functions of these glands. And, it seems to me, that the mysteries associated with functional disturbances will only be solved by a thorough understanding of the biochemical processes of the body.

In December, 1920, after familiarizing myself with the work of Rubin as reported by him and, also, after a personal visit to his clinic by Dr. S. S. Rosenfeld in order to study the technic of this procedure in detail, I instituted this method of examination at the Lebanon Hospital. The patients were carefully selected and were thoroughly examined clinically before they were subjected to this examination. During the past ten months we made one hundred examinations.

TECHNIC

The examination must be carried out under the most rigid aseptic precautions. The patient's clothing is removed and she is dressed in an operating gown. She is placed in the lithotomy position. The vagina and cervix are carefully cleansed and the latter is grasped, preferably, by a sponge holder. The cannulae employed are of the Keyes-Ultzman type with a perforation at the tip and several along

the sides. The caliber of the cannula used will depend on the size of the cervical canal. The introduction of the cannula will often be facilitated by first determining the direction of the uterine canal with a sound. The apparatus consists of a glass blown cylinder enclosing a glass siphonometer. This and its attachments can be obtained from Machlett of New York. Before introducing the cannula into the uterus I make sure that there is no obstruction in the cannula itself. This is usually determined by immersing the cannula in a sterile solution and watching for the gas to bubble through. The cannula is then introduced into the uterine cavity and the gas turned on slowly so that it takes about 15 seconds for the column of mercury to rise from zero to 100 mms. The amount of gas consumed is determined by the reading of the siphonometer which is incorporated in the apparatus. Each "bubble" approximately represents 37 c.c. of gas. Regurgitation of the gas through the cervix is prevented by the use of a rubber urethral tip, which is fitted over the cannula and snugly inserted into the lumen of the external os. The rise of the mercury in the manometer is carefully watched. In this series, the average rise in the "patent" cases was 118 and in the "closed" cases the average rise was 176. If oxygen is used not more than 300 c.c. should be introduced since oxygen is slowly absorbed and, therefore, is likely to produce pressure symptoms in the right upper quadrant of the abdomen causing pain in the right shoulder. When carbon dioxide is used a greater quantity can be introduced because of the rapidity with which it is absorbed. The patient is then fluoroscoped in the erect posture in order to see whether gas is present in the abdominal cavity. Usually the gas is seen in the right upper quadrant under the diaphragm separating it from the liver. A smaller quantity is also visible in the left subphrenic space. With increased experience one is usually able to foretell by the manometer reading, studying the rise and fall of the mercury column, whether the tubes are patent or not. However, in order to establish a positive diagnosis the fluoroscope must be employed. I have had several instances where the mercury rose to comparatively low levels, nevertheless, the fluoroscope failed to reveal the presence of any gas and vice versa, I have had cases where the mercury rose to over 200 mm. with very little fall and yet the fluoroscope showed the presence of gas. I do not allow the pressure to rise above 220 mm. of mercury; however, on two occasions the mercury rose to 250 and 260, respectively, without any complications. In patients in whom the tubes are closed the gas will usually escape through the cervix as soon as overdistention of the uterine cavity has taken place. In doubtful and negative cases, it seems to me, that it would be a good rule to have the patients re-examined a second and even a third time in order to definitely establish the diagnosis. Two of

my patients, in whom the first examination proved negative, were found to have air in the abdominal cavity on the second examination. I believe that it is possible for the gas to either dislodge or pass by the mucogelatinous substances which very often partly clog the tubes, and at times, it will even overcome a kinking of them. This may be the reason why in many of the patients the mercury column rises very high before the initial fall takes place. In my series of cases 58, or 58 per cent, were positive, i.e., air present in the abdominal cavity; 42 cases, or 42 per cent, were negative, i.e., no air present in the abdominal cavity.

CONTRAINDICATIONS

This method of examination must not be used in the presence of acute infections of the vagina or pelvic organs. The danger of spreading infection under such conditions is obvious. It also must not be used in the presence of chronic infections if the patient complains of pain. In these cases it is best to defer examination until the pain has subsided, indicating that any irritation about the pelvis has disappeared. It should not be performed at the time when the menstrual period is about to appear. Patients who have heart disease, especially when myocardial changes are suspected, should not be subjected to this examination because the pressure of the gas by raising the diaphragm may seriously embarrass the heart action.

In this series the only complications we had were: (1) a severe syncope in a patient who was quite obese. Apparently, as soon as the gas lifted the diaphragm, the heart action was interfered with. The patient became cyanosed and the pulse barely perceptible. However, she rapidly rallied and I was able to continue with the fluoroscopic examination; (2) the same, to a lesser degree, happened to another patient; (3) in one case, previously operated upon for acute appendicitis and later for intestinal obstruction, and who had adhesions in the left pelvic region. In this patient I evidently caused sufficient irritation by our manipulations so that the patient developed an acute inflammatory condition in the left fornix which lasted about two weeks and subsided under palliative treatment. Ordinarily patients will complain of pain in the right side of the abdomen and right shoulder which lasts anywhere from twelve to forty-eight hours when oxygen is used; but this pain can be minimized by the use of carbon dioxide.

A close study of this procedure convinces me that this method of examination should be utilized in every case in which the cause of sterility is of doubtful origin. It is important that the patency of the tubes should be established before any form of treatment is undertaken. It is especially useful in patients who have had a unilateral infection of the fallopian tube or in patients who have had one tube removed. Heretofore we had no means by which we could ascertain the

patency of the other tube except by abdominal operation. Our conclusions in such cases were that the other tube was also involved, but the involvement was not sufficiently great so that it could be detected by the examining finger and, therefore, many of these patients were advised to undergo a plastic operation on the tube in order to cure sterility. Patients who are suffering from fibroid tumors of the uterus, and who are sterile, should be examined in order to ascertain whether the continuity of the genital tract is not interrupted and if, on examination, we find the tubes occluded, there should be no hesitancy on the part of the surgeon to advise removal of the tumor, for pregnancy in such patients is almost impossible. It is a very useful procedure in patients who have had myomectomies performed. It will disclose whether the continuity of the genital canal has not been disturbed. This was very well illustrated in one of my cases: Mrs. A. G., twenty-eight years, married 2½ years, never pregnant, was one year ago operated upon by a well-known surgeon for multiple fibroids. She made an uneventful recovery and on vaginal examination the uterus and adnexa were apparently normal. She menstruated regularly and clinically there was no reason for her sterility. However, in attempting to "insufflate" this patient, we found complete obstruction to the passage of gas.

Patients who have had plastic operations on the tubes for the cure of sterility should be examined in order to determine whether the tubes remained patent. This procedure will, eventually, help us to make a proper evaluation of all plastic operations on the fallopian tubes for the cure of sterility; because it will make it possible to definitely tell in what percentage of patients we succeeded in overcoming the obstruction in the tubes. Until now plastic operations on the tubes for the cure of sterility resulted unfavorably in my hands as far as the correction of the obstruction was concerned. That this is so, I became more convinced since examining a number of patients who were operated upon by us as well as by others and when I tried to "insufflate" these patients I found their tubes closed.

The therapeutic value of this method of examination must, for the present, be left in abeyance. However, three of my patients became pregnant after they were insufflated. One is now in the seventh month of her pregnancy, the other in the fifth month and the third is pregnant six weeks. It is possible that the entrance of gas into the tubes under pressure will expel mucus plugs from them and also straighten out kinking which might have taken place along their course.

In conclusion I wish to state that this procedure has been used in a sufficiently large number of cases by three or more investigators to warrant its universal adoption as a routine method in the diagnosis of and treatment of sterility. I hesitated to institute this examination

fearing that untoward complications might take place and in that way, not only endanger the lives of my patients, but also expose myself to legal complications. In my hands this procedure has been found to be safe and I utilize it in every patient in whom I think it is indicated.

DISCUSSION

DR. JAMES E. KING, BUFFALO, N. Y.—There is no question of the value of this method in determining the patency of the tubes. Dr. Rongy has described the dangers which arise from this procedure, and I think it should be emphasized that this method should be used only by the gynecologist or some one competent to determine whether there is an existing infection. I have in mind a case where a very severe and almost fatal pelvic infection resulted from the use of this procedure. The case was in the hands of a general practitioner. The patient applied to him because of her seven years' sterility and he, having read an article on this procedure, got into communication with an x-ray man, with the result that they found that at least one tube was patent. One day later the patient had a slight pain. Two days later she had very severe pain. I was asked to see her at this time and found her with a very rapidly spreading pelvic peritonitis. After four weeks of very serious illness she improved and I found upon examination before she left the hospital that her pelvis was practically wrecked. Her uterus was firmly fixed and her chances for pregnancy are gone unless great absorption takes place.

DR. RONGY, (closing).—I never undertake the treatment of sterility unless the husband is examined and not only is the semen examined microscopically but we also try to determine how long the semen survives in the vaginal tract and we test it with many reagents in order to study their effects.

Dr. King is right—unless a man is sure of his pelvic pathology he should not undertake this work. One must ascertain by examination whether an infection exists in the pelvis. We never subject any woman to this examination when there is the slightest indication of any inflammation in or about the pelvis, which is of recent origin. It is in the clean cases that we use this method. To my mind this procedure is not only useful to determine the patency of the tubes but it also helps us to determine our procedure on the operating table.

The morning I left for St. Louis I operated on a woman who had a definite pathologic condition in the right tube, and while the woman was on the table and the abdomen open I made use of this method in order to determine whether the left tube was patent or not. Apparently the left tube seemed to be involved, but under pressure we succeeded in passing the gas through and therefore, left the tube in. I am sure that the gas introduced through the uterus under pressure will very often straighten kinks in the tubes and also expel the mucous plugs very often found in the outer portions of the tubes. We have often introduced the oxygen into the abdominal cavity under a pressure of 200 millimeters.

ANOMALOUS LOCATION OF THE DUODENOJEJUNAL JUNCTION

By Budd Van Sweringen, M.D., Fort Wayne, Ind.

THE duodenum is quite constant in location. Variations, in my experience at least, are few. When one contemplates a posterior gastrojejunostomy, he habitually removes the loops of small intestine from the upper left quadrant of the abdomen and searches for the first portion of the jejunum as it comes through the peritoneum in this locality. It is something of a shock when no such emerging gut can be found.

An anatomical description of the duodenum and the duodenojejunal flexure is here inserted to refresh our memories on the subject.

The duodenum forms a spirally curved ring, open to the left and above, in the concavity of which the pancreas is inserted and the terminal points of which lie closer to one another when the stomach is empty. The superior part is the shortest portion and runs approximately horizontally backward; when the stomach is empty it extends at the same time from left to right; when the stomach is full, it extends sagittally from before backward, or it may even pass from right to left. It lies to the right and in front of the lower portion of the diaphragm, the portal vein, hepatic artery and common bile duct, behind and below the quadrate lobe of the liver, crosses the porta hepatis, and by means of the superior duodenal flexure bends around beneath the processus caudatus into the descending portion of the duodenum. This runs downwards and somewhat to the left in front of the medial margin of the right kidney, to the right of the inferior vena cava, behind the left portion of the right lobe of the liver, behind the gall bladder and transverse colon and then goes over, by means of the inferior duodenal flexure, into the inferior portion of the duodenum. The latter extends transversely to the left at first in front of the abdominal aorta. This last portion runs behind the mesenteric artery and vein, crossed by the root of the mesentery as far as the left side of the body of the second lumbar vertebra and as far as the inferior surface of the pancreas and there, covered by the stomach, suddenly bends around markedly to the right and forward to go over into the jejunum. Sometimes no marked inferior horizontal portion is present; the descending portion then forms a V with the ascending part. The duodenojejunal flexure is firmly attached to the diaphragm by means of the suspensory muscle.

The peritoneal covering is present only in part of the duodenum.

A part of the left wall of the superior portion looks into the omental bursa and is covered by its peritoneum; the right and upper walls are completely covered by peritoneum, except for a narrow strip from which the hepato-duodenal ligament goes off. The descending portion of the duodenum possesses a serous covering on its right and anterior walls and only the area between the lines of attachment of the transverse mesocolon is free from it. The horizontal part of the duodenum is covered by peritoneum in front and below, the ascending portion in front and to the left, with the exception of the spot where it is crossed by the root of the mesentery.

The case which furnished the basis for these observations was a married woman, fifty-seven years of age, who had had attacks of nausea and vomiting extending over a period of ten years. Of late the symptoms were growing worse. She had lost twenty-five pounds in weight. Six years previously her appendix was removed, but the attacks of vomiting were not influenced by the operation.

The x-ray examination showed a filling defect on the upper side of the pylorus which was constantly present in every plate made. A diagnosis of pyloric obstruction, probably due to malignancy, was made.

January 3, 1921, a posterior gastrojejunostomy was performed. A small nodule about the size of an almond was found in the *anterior* wall of the stomach just proximal to the pylorus. It was rather softer in consistency than would be expected of cancer, and yet, it was felt that the only safe thing to do was to remove the mass entirely. This necessitated a pylorectomy. The tumor was removed, including an inch of healthy structure on each side of it. The cut ends of the stomach and duodenum were overcast with catgut and inverted with silk sutures.

At this point search was made for the beginning of the jejunum. It was not found in its usual location. A portion of gut, very much like the duodenum or the beginning of the jejunum, was found coming through the peritoneum to the right of the spinal column and the stoma was made with this loop of gut.

Her convalescence was marked by symptoms of obstruction which did not begin until ten days after the operation, at a time when we thought she was safe. The nausea and vomiting continued for five days. There was no stool for that length of time although she continued to pass flatus daily. A tumor formed under the upper part of the incision, which had healed perfectly. Her urine showed albumin and casts. The general condition grew worse; the pulse rose in frequency and became intermittent. Then, at a time when we had about given up the case in despair, she had several voluntary stools. The tumor at the upper end of the incision disappeared, the vomiting stopped and she made a complete recovery.

DOUBLE UTERUS AND VAGINA

By David Hadden, M.D., F.A.C.S., Oakland, California

In December, 1919, Miss E. S., nineteen years old, consulted me because of indigestion and loss of weight following influenza. Her last menstrual period had occurred in May, though prior to that time she had menstruated regularly every 20 days since the beginning of her menstrual life at thirteen years. The only symptom referable to the pelvis was a heaviness in the lower abdomen.

External pelvic examination showed a normal introitus. On digital examination it was found that a cystic mass bulged from the right side into the vaginal canal. It began one inch from the hymen and extended to the right of the cervix and above its level. It was of sufficient size and tension to make examination of the cervix and uterus difficult. The uterus appeared to be of normal size; the cervix was normal but congested. The cystic mass was not tender.

A diagnosis of a probable cyst of the duct of Gärtner was made because of the normal outlet and the level at which the cyst had its origin.

Following a few local treatments and organotherapy, the menstrual function was established and continued regularly without distress of any kind.

In November of 1920 the girl was married. About Dec. 25, I was called to her home to find her suffering with acute peritoneal irritation and presenting the picture of pelvic abscess.

Drainage of the culdesac, Dec. 28, produced large quantities of decomposed blood, and an opening into the cystic mass through the drainage incision, produced the same material. A diagnosis of double vagina and uterus with blind vaginal canal on the right side was made.

On Jan. 10, the acute symptoms having subsided, I did a laparotomy. The uterus was double, but the right side was connected at the internal os with the left, though the cervices and vaginae were independent. The right uterus was smaller. The tubes and ovaries were normal. The appendix was congested.

I removed the right uterus and tube and carefully closed the opening into the left uterus. I then made a permanent opening into the right vagina from below so as to care for any vaginal secretion, as a removal of that structure seemed inadvisable and unnecessary.

The woman has been normal since the operation and at the time of writing is probably six weeks' pregnant.

THE THYMUS GLAND IN THE NEWBORN

By Sylvester J. Goodman, M.D., F.A.C.S., Columbus, Ohio

IT IS probable that "thymus death" of the newborn is much more frequent than the rather meager statistics would lead us to believe. During the early years of my practice I saw quite a number of babes die because I failed to recognize a condition which we now know to be caused by thymus hyperplasia.

While Crotti was writing his excellent treatise on goiter, we frequently discussed this subject, especially from the standpoint of the obstetrician, and it was from him that I received the impetus to study this anomaly of the newborn. Crotti has made an extensive study of this condition and has seen most of my cases with me. I have been constantly on the watch for cases of thymus hyperplasia and now have nineteen cases to report, which came under my observation during the last five years. Undoubtedly other cases have occurred in our hospital but they were not recognized in time for diagnosis and treatment.

While the statistics are rather meager, it might be interesting to note that Hedinger reported in 1910 that in the Berne Pathological Institute, among forty-four postmortems of the newborn the thymus enlargement was extremely marked in twelve. I am convinced that many infant deaths, diagnosed as "'blue babies," are, in reality, cases of thymus death.

A short résumé of the surgical anatomy of the thymus gland will aid us in the consideration of this subject.

The thymus is formed by two lobes which are in close relation, one with the other, but entirely independent; no isthmus is present. The thymus lies in the upper and anterior portion of the mediastinal space, just behind the manubrium and corpus sterni. It covers the base of the heart, the origin of the thoracic vessels, such as the aorta, pulmonary artery, the innominate veins and arteries, the vena cava and the trachea. Furthermore, the thymus comes in contact with the vagus, inferior laryngeal and phrenic nerves; laterally, it comes in contact with the pleural membrane. In cases of extreme hyperplasia the thymus covers the entire pericardium and may reach the diaphragm.

The causes of sudden engorgement and enlargment of the thymus are not well understood. I believe, however, that thymus engorgement can result from too vigorous attempts at resuscitation. The irritation caused by bending and twisting the newborn baby, together with rough or vigorous wiping of the throat to remove the mucus, undoubtedly causes engorgement of the thymus. The pressure of the enlarged gland upon the trachea or bronchi embarrasses respiration and is responsible for the death. Case 6 was, probably, the result of too vigorous manipulation of the child.

Hyperplasia of the thymus is not infrequently combined with a concomitant hyperplasia of the entire lymphatic system. This condition is known as the

status lymphaticus of Paltauf. When there is a concomitant hyperplasia of the thymus, the condition is known as status thymolymphaticus. While preparing this paper, I was visited by the boy who is listed as Case 1; this child is a typical example of status thymolymphaticus. He is pale, weak, nervous, and irritable. He has a large mass of adenoids and his tonsils are enlarged and unhealthy. He is backward in his studies and has consulted me regarding the removal of the adenoids and tonsils. I am afraid, however, that he is a bad risk for operation.

The most striking symptom of thymus hyperplasia is dyspnea. It was this symptom which called my attention to Cases 4, 5, and 6. The dyspnea may be characterized by labored respiration only or by the most intense choking spell. Between these two extremes, all forms are found. Dyspnea may be constant or intermittent, and with or without acute paroxysms. Between attacks respiration may be normal. There may be a constant and inspiratory stridor; in extreme dyspnea, an expiratory stridor may be found. The choking spell may occur without cause or when the child cries from pain or anger. Hyperextension of the head or dorsal decubitus exaggerates dyspnea. This would explain why dyspnea is more marked during sleep than during waking hours. The choking spells may last but a few minutes, or a few hours, or a few days, and respiration then become normal again. In other cases death ensues. In children, the dyspneic symptoms may be acute or chronic; all of my cases were acute with the exception of Case 7.

Certain cases of asphyxia of the newborn can be explained only by thymus hyperplasia. In such cases the child is born apparently dead, so that it takes quite a long time to bring it back to life; cyanosis is marked, breathing remains difficult and loud; in many instances the child dies after a few minutes or hours. Postmortem examination shows compression of the windpipe by a hyperplastic thymus. In other instances the child may have been in good health for weeks or months when a most unexpected choking spell comes on. Suddenly, without any apparent cause, the child throws his head back and makes intense efforts to get his breath. He rolls his eyes upward and his face, especially the lips and tongue, become cyanotic and swollen. The veins of the neck are swollen and a loud stridor is present. The entire accessory respiratory musculature is called into play. Soon, however, everything relaxes and the pupils become widely dilated; cyanosis subsides and is replaced by a gray, ashy color; the lips and tongue become livid; the child is dead; no one has had time to realize what was going on.

All cases do not have such a fulminating character. All choking spells are not fatal; they may subside and are replaced by intervals of quiet and easy breathing. Such cases are the ones in which an early recognition of the condition and prompt treatment of it will save

the patients' lives. The physician may or may not connect these symptoms with thymus hyperplasia but, even if he makes a correct diagnosis, the parents will probably not consider an operation necessary until the symptoms have become more urgent. Unfortunately, however, sudden death is sometimes the first symptom which reveals the latent form of thymus hyperplasia; in a great many cases, in fact, this condition is revealed only at the autopsy. Case 7 may be explained in this way.

The choking spells and thymus death may be explained as follows: Pressure may take place at the superior opening of the thorax or in the thorax. Because of the relation of the thymus to the thyroid, with which it is connected by the thyrothymic ligament, the thymus follows the up-and-down movement of the trachea and larynx during the various acts of swallowing, coughing, hyperextension of the head et cetera. Consequently, the thymus, when hyperplastic, comes up like a wedge between the spinal column and the manubrium sterni. There it is caught and constricted at the superior opening of the thorax, the so-called "critical space." Inasmuch as the bony ring which forms the superior opening of the thorax is nonelastic, the organs which it contains must necessarily undergo compression. Since the trachea lies immediately below the thymus, it is the first to be compressed; hence, the choking spells.

Every effort should be directed toward detecting the presence of thymus hyperplasia when the symptoms point toward this condition. In children, as a rule, the diagnosis is easy. Percussion over the manubrium sterni reveals a dullness which, in cases of marked hyperplasia, overlaps the ribs and cartilages on each side. Auscultation over that region reveals a prolonged expiration, tubular in character. A finger placed above the episternal notch may not be able to feel the impact of the rising thymus during deglutition, coughing et cetera; the most certain way, in addition to interpreting the general symptoms, to detect thymus hyperplasia in children is given by the x-ray; the shadow, in form and location are, so to speak, pathognomonic and the diagnosis may be made with certainty.

Thymus enlargement is not the only cause of a congenital stridor and respiratory trouble. There are several other conditions which may produce the same symptoms but the cases reported here are examples of respiratory embarrassment due to thymus enlargement.

The treatment of thymus hyperplasia resolves itself into a choice of two methods. In the newborn it is absolutely essential that a prompt diagnosis be made and that treatment be instituted immediately. My cases have been treated by surgery and by the x-ray; both methods have been reasonably successful, but I favor the use of the x-ray in the newborn. Babies do not stand the loss of blood, and I think, valuable time is lost if the case is in the hands of a surgeon who is not expert in this particular line of work. It is little less than marvelous to note the improvement in the cases in which the compression has been

relieved. The dyspnea disappeared instantly when Crotti removed the thymus in Case 1; the improvement in those cases treated by x-ray was a little slower. Where the requisite surgical skill is not available, I should advise the use of the x-ray. We prolong the exposure to the rays to about four minutes.

Of the nineteen cases reported, four died. Of two operated, there was one death. One case died before operation could be performed. In this case there were no physical signs of thymus enlargement with the exception of asphyxia. Autopsy proved the diagnosis. One patient died about three months after birth. The death was sudden and was shrouded in mystery until careful examination revealed an enlarged thymus. No treatment had been given in this case as there had never been any suspicion of the presence of an enlarged thymus. One died because treatment was started too late.

CASE 1.—Baby delivered by cesarean section because of disproportion between the size of the child and the mother's pelvis. The operation was easy and short of duration. The baby seemed to have a great deal of difficulty in breathing and was vigorously spanked by the assistant. In a few minutes, however, the child was breathing almost normally. We soon noted the prolonged expiration, stridor, and cyanosis. The child was spanked and oxygen administered. In a few minutes more, it became pink and seemed to be getting along nicely. Soon, however, it became cyanotic again. This sequence continued for several hours, the baby becoming progressively weaker and more difficult to resuscitate. I called Crotti, who promptly reminded me that we probably had a case of thymus hyperplasia. He operated at once, with the result that there was an immediate "clearing up" of all unpleasant symptoms and that the child subsequently returned to apparently normal health. The thymus was removed without anesthesia. This child is still living but is of the status thymolymphatic type.

CASE 2.—Forceps were used but the delivery was not particularly difficult. It was thought that the child was dead, but our efforts were rewarded by complete resuscitation. The baby soon became cyanotic, however, and a loud stridor and prolonged expiration were noted. A diagnosis of thymus hyperplasia was made and Crotti was called upon to operate. Operation was made without anesthesia, and a very large gland removed. The child died several hours later.

CASE 3.—This baby was delivered by Welch, of this city, after a tedious but normal labor. The child seemed well at birth and cried lustily. Several hours after birth, it became cyanotic and developed convulsions. The face became blue, the eyes bulged, the vessels of the neck were distended, and convulsive movements involved the entire body. I was called to see the baby and examination showed a case of thymus hyperplasia. I advised a four-minute exposure to the x-ray. Within an hour the baby was breathing easily and after four hours the convulsions ceased. The child is alive today.

CASE 4.—This case is almost an exact duplicate of the preceding one except that there were no convulsions. The enlarged thymus was easily felt and a four-minute exposure to the x-ray relieved the child of the dyspnea. The baby is alive today.

CASE 5.—This was an exceptionally difficult forceps case. The baby did not breathe at birth although the heart was beating normally. My assistant and

I worked for three hours with various methods of artificial respiration. As soon as the child was born and we had noted the failure to breathe, I examined the neck for thymus enlargement. No thymus could be felt. After we had worked for a long time, we tried to introduce a catheter into the trachea and found that it was compressed. I then called Crotti but the child was dead before he arrived. Autopsy revealed an unusually enlarged thymus wedged into the bifurcation of the bronchi. The mass compressed the trachea and the bronchi. That the lumen was not completely closed is evidenced by the fact that we were able to blow enough air into the lungs to prolong life for a few hours. From the above, it may be noted that the devices offered for mechanical aid in resuscitation of the newborn are generally worthless. Had we made an early diagnosis in this case, I believe that we could have saved the baby.

CASE 6.—Here again we had a very difficult forceps delivery. The baby had undoubtedly inhaled a large amount of mucus. When born it was blue and did not breathe. Very vigorous attempts at resuscitation were made and great quantities of mucus forced from the lungs. The trachea was "milked" and the throat wiped repeatedly by my assistant. Cyanosis persisted and respiration was labored. Expiration was prolonged and a loud stridor was heard. Examination of the thymus was unsatisfactory but the symptoms indicated thymus engorgement and enlargement. The explanation was offered that we had been too vigorous in our attempts at resuscitation, thereby causing an irritation and engorgement of the thymus. The child suddenly extended the head, became very cyanotic, the eyes bulged and the tongue protruded. The vessels of the neck were engorged and respiration seemed completely obstructed. The baby was immediately exposed to x-rays for four minutes. Relief was almost instantaneous, the color returned, breathing became easy. Respiration, however, was extremely rapid, running as high as one hundred and fifty per minute. Respirations soon became slower and the baby is alive and well; it is now twelve weeks old.

CASE 7.—There is nothing of interest about the birth of this child. The mother, a two para, refused to nurse as she said that she had an aversion to a baby at the breast. The baby seemed to thrive on bottle feeding and left the hospital at the usual time. Nothing unusual was noted in the progress of the child for about three months. Then it died suddenly during the night. It seemed as well as usual when put to bed. On arising and taking the bottle to the bed, the parents were shocked to find the baby dead. No autopsy was allowed, but a very careful examination plainly showed an enormously enlarged thymus. It was impossible to pass any bougie or catheter past the obstruction. This case corresponds to Crotti's description of sudden death without apparent cause. Death was caused by thymus hyperplasia. No doubt, a careful search for this condition would explain the cause of sudden death in numerous cases.

CASE 8.—Very large male child. Extremely difficult forceps delivery on account disproportion between size of child and mother's pelvis. On delivery baby did not breathe and we thought that we had caused a brain injury. Prolonged manipulation rewarded our efforts and child seemed to be doing nicely. About two and one-half hours after birth, the baby turned blue. Respiration was embarrassed, the eyes bulged, and the vessels of the neck were greatly engorged. Vigorous spanking revived the baby and he seemed to do well for several hours, then again became cyanotic. Four minutes' exposure to x-ray. Within five minutes he regained his normal color and there were no untoward symptoms until about ten hours later when he became slightly cyanotic. Four minutes' x-ray exposure given and no further trouble occurred.

CASE 9.—This was a perfectly normal delivery in a primipara with good history. Thirty hours after birth of child I was stopped by one of our nurses, as I was making rounds in the hospital, and asked if I could tell her why a newborn babe should turn blue every once in a while. She said her sister had a new baby and that it became cyanotic the day before, an hour after birth, and it was necessary to spank it to revive it. This had happened a number of times and the intervals between the attacks were becoming shorter and greater efforts to revive baby necessary. I saw the baby several hours later and found all the usual symptoms of thymus hyperplasia. The attending physician could not be convinced of the condition until the x-ray demonstrated an enormous thymus pressing upon the trachea and crowding the heart down. This child was given four minutes' x-ray treatment and revived at once. The result was startling and I thought that I had indeed saved a life. Baby died three hours later. No autopsy.

CASE 10.—Mother, a primipara thirty-two years of age. Always perfectly well but very nervous. Baby born after difficult forceps delivery on account of large head, thrived well and seemed perfectly normal for three and a half months. Breast fed. About one month before thymus symptoms were noted, the mother remarked that her baby was quite hoarse and coughed at times. I reassured her but unfortunately did not make a careful examination of the baby. Late one night I was called and found the baby in a frightful convulsion. This condition continued, at intervals of one to two hours, for three weeks. A diagnosis of thymus hyperplasia was made and x-ray showed an enormous thymus. Four-minute exposure made on three successive days without any signs of burn. The child was taken from breast and put upon cow's milk. All then seemed well for a few days. Then she had another convulsion. At this time a diagnosis of tetany was made. Various medicines were prescribed and given without result. After two weeks, during which time the baby had a great number of convulsions, we again gave x-ray treatment. The breast feeding was resumed and the baby gained notwithstanding the convulsions. A picture one month later showed great reduction in size of thymus but convulsions occurred at intervals of several days. At this time the baby seems to be entirely well and has gained in weight until it is about normal. The thymus is now very small and there have been no convulsions for several weeks. There were none of the classic symptoms of thymus enlargement except the convulsions. All known tests were made for lues but were negative. This was probably a case of thymus hyperplasia in the beginning and later tetany. It will be noted that x-ray can be given as often as every three days in some cases, and in this case every day for three days, without a burn. Different parts of the trunk were exposed each time.

CASE 11.—This case was in a baby delivered at 4 a.m. At 9 a.m. the same day the baby became extremely cyanotic and appeared to be choking to death. The family doctor was called and at once made a diagnosis of thymus hyperplasia. He took the child to the hospital and a four-minute exposure to the x-rays ended the trouble. A second treatment was given three days later as a prophylactic measure. The x-ray plate showed an enormous thymus pressing upon the heart and trachea. The baby revived while under the x-ray tube and fell into a quiet sleep.

The other eight cases showed the usual symptoms of thymus hyperplasia. They were born normally and the symptoms came on at times varying from birth to three days after. They were all cyanotic and

several had convulsions. All received x-ray treatment and responded beautifully. There were no deaths in this series.

The cases cited above are reported in order to stimulate interest in thymus hyperplasia in the newborn rather than to present anything new. We believe that prompt recognition of this condition and immediate surgical or x-ray treatment will save many babies that might otherwise be lost.

In conclusion, I wish to thank Dr. André Crotti for his courtesy in allowing me to quote from his book.

CERTAIN POINTS IN THE MANAGEMENT OF THE SECOND STAGE OF LABOR

By Ross McPherson, M.D., F.A.C.S., New York

IN CHOOSING this title for your consideration, I feel that it is more or less of a presumption on my part, as any attempt to cover the entire subject of the management of the second stage of labor in one paper of a few minutes' duration is, on the face of it, impossible; my remarks then must be limited to an effort to consider certain special facts which experience has shown to be important in a survey of a large series of cases both in private and hospital practice.

The maternity case is in general divided into three periods, the prenatal or period before labor begins, the labor period itself, again divided into three stages, and the postnatal. To properly conduct the two latter divisions it is of the utmost importance for the accoucheur to have a comprehensive knowledge of the prenatal or antepartum condition of his patient, and the physician who neglects this important part of his duties, not only runs a risk of future trouble, but does not gather the information which should be of the greatest possible assistance to him in the conduct of the labor itself. Frequent communications with the patient either at the home or office, together with the general and special physical examinations, pelvic measurements, blood pressures, urine analyses, advice as to diet and hygiene, all serve to establish an intimacy, knowledge and confidence between physician and patient without which no confinement can be conducted successfully.

Assuming, however, that this prenatal period has been properly and competently terminated, that the patient has passed through the first stage of her labor, and has attained full cervical dilatation, thereby reaching the second stage, what are the duties of the attendant, first toward the mother's comfort and progress, and second toward the welfare and successful birth of the child?

If we follow the lead of Potter, of Buffalo, immediate intervention on the part of the physician under surgical anesthesia, and the performance of an internal podalic version, settles the question for us at once and there is no need of further discussion. Unhappily, everyone in contact with obstetrical work is not a specialist and has not yet attained Potter's facility with this operation, lacking which it will be wiser for the majority of those caring for confinement cases not to attempt to emulate him, certainly not unless especially trained.

There will be, therefore, a very large number of mothers in whom Nature's efforts will be necessary in order for the labor to proceed, and our position will have to be that of waiting and watching until the presenting part is ready to be born.

In general, in the second or expulsive stage, so long as the pains are regular and strong, the progress downward of the presenting part, steady and continuous as indicated by external palpation, rectal examination and evidence of bulging, and auscultation of the fetal heart shows no signs of fatigue on the part of the child, the case need not be interfered with while the passage through the pelvic cavity is taking place. Some degree of analgesia at this time is usually indicated and of the various analgesics, nitrous oxide oxygen, properly administered, probably holds the first place. The method of administration is important and should be as follows: The anesthetist with a full bag of the nitrous oxide and oxygen mixture is seated by the bed and has one hand placed on the patient's abdomen over the fundus. At the first sign of a contraction which the anesthetist will note before the patient feels any pain, she is instructed to take five or six deep breaths of the gas. This will produce in most cases a considerable relief from suffering, indeed, in many almost entire relief apparently strengthens the contraction and does not injure the child. The same maneuver is repeated with each succeeding pain and continued until the presenting part is ready for delivery when the anesthetic can be pushed to full degree or a change made to ether if preferred by the physician.

Too much stress cannot be placed at this time upon the importance of encouraging the patient as to her progress. Repeated assurances by the attendant that all is going well, that the termination of the event is momentarily expected, all serve a marked purpose in keeping up the courage of the mother and stimulating her to further efforts.

Constant watch should be kept to see that the bladder does not become distended and if the patient cannot voluntarily void, the full bladder should be emptied by means of careful aseptic catheterization.

It is assumed that the rectum has been emptied by means of an enema late in the first stage in all instances.

In the normal case the foregoing practically covers all that is necessary to be done while the presenting part is passing downward through the pelvic cavity until it has arrived at the perineum. When this stage has been reached, and a vertex is presenting, we have a wide diversity of opinion as to the proper procedure. Many obstetricians notably DeLee of Chicago, Polak of Brooklyn, as well as others of prominence, are giving much attention to the so-called prophylactic low forceps, usually preceded by a median or lateral episiotomy, thus practically obliterating the perineal stage. It is argued that much

delay to the mother and child is thus eliminated in addition to securing a clean cut wound in the perineum which is easily repaired and heals well, in contradistinction to the jagged laceration which may result if the perineum is simply left to itself, or is "supported" in the usual manner. This has been emphasized by Harrar of New York and Pomeroy of Brooklyn.

Others believe in "'ironing out" the perineum before the presenting part has descended, claiming that in this way lacerations are avoided and repair made unnecessary. Violent opposition to these views and manipulations has developed, but after a very large experience and having tried all of the procedures advised, I am inclined to believe that in the average primipara, under suitable surroundings, in the hands of a competent obstetrician with full anesthesia and proper technic, an easy low forceps where no pressure is applied by the blades and which is preceded by an episiotomy just as the perineum begins to distend, offers a more satisfactory means of delivery than by waiting for Nature to effect the birth. The average multipara, on the other hand, is probably better let alone, if progress is satisfactory. It is not expected that everyone in the audience will subscribe to this statement and I certainly do not advise anyone to attempt it as a routine procedure unless skilled both in diagnosis and the use of obstetrical and gynecological instruments.

Breech cases, if proceeding normally, are best let alone until the breech is fairly well expressed, when the delivery should be terminated in the proper manner, by manual extraction.

Pituitrin is administered after the birth of the child, *before* the delivery of the placenta, and it is believed that by its use, firmer contractions of the uterus take place, less bleeding occurs, the third stage is shortened, and repair of the perineum is made more easy. Retention of the placenta has not been observed in a large series of cases, and afterpains are notably decreased in patients where it has been employed. On the other hand the use of pituitrin to stimulate the expulsion of the child is rarely if ever to be advised, then only in patients in whom no disproportion between the mother's birth canal and the child exists, where the cervix is entirely effaced, and then only in doses of two or three minims. Its use for this purpose is assuredly dangerous and not to be ordinarily recommended or employed except in cases that are so few that they can practically be disregarded.

As stated in the beginning of the paper, the reader recognizes that these remarks are merely in the nature of suggestions on special phases of the subject and if a discussion of some of the points brought out can be evoked, his object in bringing them before you will have been attained.

CLINICAL EVIDENCE VERSUS X-RAY FINDINGS IN CASES OF FUNCTIONAL DISTURBANCES FROM OMENTAL ADHESIONS

By David Hadden, M.D., F.A.C.S., Oakland, California

I THINK at the present time it would be well to ask ourselves whether or not we are inclined to lay too much stress on the reports of the roentgenologists in cases of abdominal pathology. There is no denying the fact that we can obtain a great deal of valuable information from the x-ray after a barium meal. On the other hand are we not too apt sometimes to overlook the clinical aspects of the case and depend on the roentgenologist's report too implicitly?

The x-ray operators may be classified into three groups. One group gives a series of x-ray plates without any screen examination or written report. The second group gives us a written report of the screen examination findings, but claims it does no good to take plates unless a large series are taken; the third group presents us with a written report of the screen examination and also a small series of plates.

I feel that the men using the third method of presenting the results of their examinations, especially if the man has been properly trained and understands the physiology and pathology of the abdominal cavity, will give us reports of greater value; however, it is interesting to find that even from the best men the reports often do not conform with the clinical or with the operative findings. It is for this reason that the question presents itself to me, as to whether or not we are prone to lay too much stress on the x-ray findings, often to the exclusion of those found clinically.

The x-ray plates of the abdomen after a barium meal, taken at intervals but without a screen examination, whether accompanied by the roentgenologist's diagnosis or not, are seldom of practical value.

This method of investigating the abdominal cavity would be of value if the pictures were taken at very frequent intervals throughout the whole twenty-four hours; but, of course, the expense of such a procedure and the time involved, puts it absolutely out of the question in ordinary cases.

On the other hand, the physician who makes screen examinations, but does not check up or record his evidence with plates, is even more prone to come to an erroneous conclusion.

Case 1.—A short time ago, I had an interesting instance, which bears out such a possibility. The patient was a woman of about thirty-five years of age, without any previous history of importance, except the fact that she had had an

appendectomy some years before. She complained of distress with some pain in the lower abdomen, but this pain had no relation to the pelvic physiology. The medical man, who referred the case, suspected that there was probably some pelvic pathology which accounted for the pain. A careful examination of the pelvis, however, revealed nothing except the fact that the cecum seemed to be low down and drawn somewhat to the median line.

She was sent to a diagnostician for x-ray examination of the gastrointestinal tract. He reported that there was nothing in the digestive tract to account for the tenderness or the pain; but, he added, that if he had not known that her appendix had been removed, he would say that it was still present. His conclusion, after a screen examination of the patient, was that the trouble was undoubtedly in the pelvis where he hoped it would be found.

The report of the screen examination of the patient, in reality, confirmed my diagnosis; especially as there was nothing in the uterus, tubes, or ovaries that could account for the pain. So I still held to the conclusion that the trouble was due to an adhesion between the right broad ligament or posterior surface of the uterus and the cecum. This diagnosis was based chiefly on the history, because the patient stated that the pain and tenderness was always more marked when she was constipated and relief followed usually when the bowels were entirely emptied. She said that the pain had no relation whatever to her menstrual period and was not aggravated thereby. The position of the cecum, low down and somewhat behind the uterus, confirmed that diagnosis.

The statement of the roentgenologist regarding the appendix justified this conclusion, for the incisura which he noticed was, undoubtedly, due to the cecum being fixed at that point by adhesions. An operation later confirmed this diagnosis.

In this case pictures, taken at the time of the screen examination, might have been of great assistance to the roentgenologist in arriving at the correct conclusion by giving a chance for study of the relations of the ileal, cecal, and appendix areas.

The screen examination of the digestive tract is so much a matter of the personal equation that, it seems to me, it is always wise to check it up with plates in order to be sure that there is a confirmation of the screen findings.

It is from a well trained roentgenologist who not only makes his screen examinations, but who also takes a sufficient number of plates to prove his conclusion, that the surgeon obtains the greatest assistance.

It is well to remember that the barium pictures of the digestive tract are nothing more than a shadow of the lumen of the bowel, and that that lumen may become so distorted by adhesions or pressure, and be so abnormal as to be mistaken for other parts of the digestive tract.

CASE 2.—A short time ago I was called to see Mrs. L. F., who was complaining of severe pain in the abdomen. She was unable to retain food and had considerable tenderness over the pelvis. Some fifteen years before she was subjected to a hysterectomy and removal of the appendix. For some time after this operation she was in pretty fair condition, but later began to have general nervous symptoms which were diagnosed as nervous prostration. In fact, at one time she was in a hospital for ten months for a rest cure; yet, at the end of that time, she showed little improvement. As far as I could gather from her history, there was

nothing which would lead one to suspect anything wrong with the digestive tract; and, probably, the physician had good reasons for looking upon the case as one of prolonged surgical menopause. During the years that followed, she was in the hands of a physician occasionally, sometimes showing definite improvement and again none. On the whole the treatment consisted of general hygienic and supportive measures with some organotherapy, and the physician who referred her to me had accomplished a great deal in that way, until the symptoms of nausea and pain began; though for some months prior she had had considerable indigestion.

The time I saw her she was, undoubtedly, suffering from a partial intestinal obstruction. She was sent to a roentgenologist. His report was as follows: Screen examination during the administration of a barium sulphate meal showed the stomach to be in good position, somewhat hypertonic, but freely movable and flexible. Peristalsis was well marked on both curvatures of the stomach, with a pronounced incisura over the junction of the pars media and the pyloric portions, which was persistent throughout the entire examination. At the end of six hours there was some gastric and duodenal residue, with the head of the meal entering the cecum. The terminal ileum and cecum were freely movable and separable without evidence of adhesions and localized tenderness. Plates confirm the screen examination.

Summary: The screen examinations together with the x-ray plates indicate a gastric ulcer, probably on the posterior wall near the lesser curvature and about the junction of the cardiac with median portions of the stomach. Otherwise, the gastrointestinal tract appears to be negative. There is a moderately smooth depression in the duodenal cap, which would suggest some enlargement of the gall bladder, but this was not constant. Therefore, from an x-ray viewpoint, enlarged gall bladder is somewhat questionable.

While I felt that from the clinical evidence the trouble was far more likely to be in the lower abdomen, especially around the cecum, still, at the time of the operation, I modified my incision sufficiently to get a thorough view of the stomach, not only anteriorly but posteriorly. There was nothing abnormal about that organ; neither was the duodenum or gall bladder at fault. At the ileocecal junction, however, we found that a loop of the terminal ileum had become twisted in consequence of the previous operation and, with the contracting down of the scar tissue, gave us almost a complete obstruction at that point. The omentum was firmly adherent to the anterior abdominal wall at the site of the previous incision and, within the pelvis it was attached to the bladder and rectum.

It was very evident that the x-ray findings in the upper abdomen were produced by the pull of the omentum upon the stomach and duodenum. In going over the x-ray plates after the operation I found that the portion of the digestive tract which was taken for the cecum by the roentgenologist, was the dilated terminal ileum, and the stricture at the ileocecal valve was accepted as a normal contraction of the ascending colon. The transverse colon had emptied itself pretty rapidly so that the particular plate taken did not show the relation of that organ to the other portions of the digestive tract. By superimposing the twenty-four hour upon the six-hour picture, the narrowing of the lumen at the ileocecal valve immediately became apparent. Since then it has always been my routine practice to superimpose one x-ray plate upon the other; and this procedure has, more than once, given me evidence overlooked by the roentgenologist which checked up with the clinical findings

A few months after this case, Miss D. B. was referred to me, she had had six abdominal operations. The doctor who sent her to me for examination felt that there was, undoubtedly, something wrong with the bladder. The girl had

periodic attacks of pain over the bladder with inability to evacuate that organ; in fact, she would have to be catheterized for several days at a time. The pain was of a spasmodic character, but was not definitely located anywhere in the abdomen, although she complained more often of the bladder. The original operation was an appendectomy. The urinary tract trouble followed this operation. The second operation was a complete hysterectomy; but what was done at the other operations, except possibly the freeing of adhesions, I was unable to discover. When I first saw the patient she suffered severe pain, was unable to retain anything on her stomach and could not urinate. The catheterized urine was perfectly normal and there seemed to be no reason why a cystoscopic examination should be done.

The roentgenologist's report was as follows: Screen examination during the administration of a barium sulphate meal showed the stomach to be in good position, of good tone, and freely movable and flexible. Peristalsis was normal on both curvatures; the pylorus smooth and of good contour. There was considerable tenderness over the region of the pylorus, but it was not sharply localized. After six hours there was a large gastric and duodenal residue with the head of the meal at the hepatic flexure. Twenty-four hours later there was some terminal ileal residue; the tip of the cecum being deformed and suggesting adhesions in this area. There was marked tenderness over the cecum, which made manipulation of this region very difficult. The colon was fairly well filled, and the transverse colon being somewhat low in the standing position. Plates confirm the screen examinations.

Summary: Aside from the suggestion of adhesions in the right iliac fossa, the gastrointestinal tract is negative. No organic lesion was found to account for the large gastric and duodenal residue observed.

Even in view of the x-ray findings, operative procedure was recommended. Operation was refused at this time. However, within ten days the symptoms recurred with just as much aggravation and the girl consented to an operation. I found that the sigmoid was pulled over to the median line and adhering to the bladder. The cecum and omentum were attached to the site of the numerous incisions in the right abdominal wall. There was a definite transverse band of adhesion extending across the transverse colon which was visible only when the omentum and colon were delivered from the abdomen. There were other narrow band-like adhesions extending to various sections throughout the abdomen, otherwise all the abdominal organs were in good condition. All adhesions were carefully cleared up, no raw surfaces were left, and the abdomen closed. The girl made an excellent recovery and within two months after the operation she was back at her nursing, which she had had to leave for the two years because of suffering following the appendectomy.

This is another example of a case where the x-ray diagnosis was practically of no aid, except to show the possibility of adhesions around the cecal region. It also helped to emphasize the fact that one can have very marked bladder symptoms and yet have nothing wrong with the urinary tract itself, except from a mechanical standpoint, and that factor outside the urinary system. The bladder symptoms here were, undoubtedly, due to the pull of the sigmoid flexure, and whenever that portion of bowel became loaded, which it did periodically, it was a very difficult matter to get the girl's bowels to move and, naturally, her bladder symptoms were aggravated.

CASE 3.—This case emphasizes the criticism made in the beginning of the paper with reference to the physician who takes no plates. Miss M. M. was referred to me because of vague, indefinite digestive tract symptoms. I say vague, because from week to week and month to month, her symptoms varied. They were mostly attacks of indigestion without any definite localized pain, but often accompanied by very severe nausea. She had considerable urinary tract symptoms which showed mainly a difficulty in emptying the bladder but, at times, also in poor control of the sphincter. She had been to a physician who had made a thorough physical examination with barium meal screen examination, but he had taken no plates. In his opinion there was nothing abnormal. His report is as follows:

After six hours the stomach is empty. There may, possibly, be a little in the duodenal cap. There is some ileal stasis, and a great deal of gas in the hepatic flexure and ascending colon. The hepatic flexure is high up under the liver. More barium drops promptly into a long, fairly tonic stomach, which shows good outlines; very little peristalsis. There is a large, flabby duodenal cap with good outlines. X-ray examination shows cecum well filled and in normal position. Hepatic flexure is in normal position. Transverse colon slightly dropped. The left half of the transverse colon is very tonic. There is a slight suggestion of diverticulitis in the region of the hepatic flexure.

November 12, x-ray examination shows some barium still in the rectum after four days. "There are no diverticulæ in the colon as far as I can see." He further adds, "my impression at the time was that a good deal of her trouble was due to nervousness and mucous colitis. As I read over the history now, however, it seems to me that she must have some organic lesion, and the most probable one would be a diseased gall bladder. The difficulty with this woman was that she had been operated upon so much already that it was hard for me to know what to do next. Sometimes we have a lot of adhesions and nothing can be done except an operation; that, probably, was at the back of my mind when I suggested no operation. I thought that she should have some plates taken of the gall bladder region, as they might show something."

A year later the patient was referred to another roentgenologist for examination. His report is as follows:

Screen examination during the administration of a barium sulphate meal showed the stomach to be in good position, somewhat spastic, particularly in the pyloric region, but freely movable and flexible. Peristalsis was well marked on both curvatures; the pylorus smooth and of good contour; the duodenal cap slightly deformed, suggesting adhesions. After six hours there was some gastric residue with the head of the meal in the descending colon, and some slight tenderness on manipulation of the colon. After twenty-four hours the colon was still well filled. Manipulation of the cecum suggested adhesions. There also appeared to be a small duodenal residue after twenty-four hours. Plates confirm the screen examinations.

Summary: Taking the screen examinations together with the plates, the x-ray is indeterminate between gall bladder disease and duodenal ulcer, with the x-ray pointing to the gall bladder rather than to the duodenum as the site of the trouble.

Though in this case both roentgenologists were incorrect the plates, viewed from the clinical history standpoint, confirmed the clinical findings. Clinically the patient presented no gall bladder or duodenal symptoms. She had, however, a low cecum and, from the findings of a pelvic examination, showed that the omentum was low in the pelvis behind the uterus and probably fixed. Operation showed that this was the condition. The omentum was adherent along the line of the previous incision, as well as to the posterior surface of the uterus. The cecum was pulled over toward

the median line and firmly attached to the omentum. There were no other adhesions of importance and no evidence of stomach, duodenal, or gall bladder affection. The correction of the pathology had cleared up all of the digestive symptoms and established a normal bowel function; the patient prior to operation having been markedly constipated.

CASE 4.—Miss K. McC. was operated upon for chronic appendicitis two years ago last August. I saw her in October last suffering from acute abdominal symptoms. Pain, nausea, considerable tenderness over the abdomen, especially the lower abdomen, but she was without temperature or any increase of blood count. She was markedly constipated. Abstinence from food, enemata, and an ice bag, cleared up her symptoms for the time being. Some weeks later a similar attack occurred and she was sent for x-ray examination. Reports from the roentgenologist showed the digestive tract to be, apparently, normal. An operation, performed one month later, showed that a band extended from the lower edge of the stomach across the transverse colon. This band was about the thickness of a lead pencil and pressed down on the transverse colon in such a way that, with the distention of the proximal portion, almost complete obstruction ensued. Evidently, as soon as the peristalsis was controlled, the pressure of the band was released and the contents of the bowels moved on, relieving the patient of her symptoms. I also found that the omentum was attached to the parietal peritoneum in the right iliac fossa. The condition was corrected and since that time there has been no trouble. The band across the transverse colon could have been very readily overlooked as it became apparent only after the omentum was freed and delivered from the abdomen. It is plausible that, if a more careful x-ray examination had been made, the trouble might have been diagnosed; however, the clinical symptoms were those of a definite, temporary construction.

CASE 5.—Mr. H. H. S. was referred to me, suffering from an acute attack of indigestion. He had had an operation for ruptured appendix some years before and since then, at intervals of about six months, he was subject to attacks of severe nausea, followed by great pain and, finally, by persistent vomiting until the stomach was fully emptied. He was markedly constipated and suffered more or less all the time from mild indigestion. He had marked tenderness over the gall bladder. The cecum was fixed and occasionally very tender. The report of the roentgenologist was as follows:

Screen examination during the administration of a barium sulphate meal showed the stomach to be of good position, somewhat hypertonic, but freely movable and flexible. Peristalsis was well marked on both curvatures; the pylorus smooth and of good contour; the duodenal cap small but fairly well formed. After six hours there was considerable gastric residue with the head of the meal in the ascending colon. After twenty-four hours the colon was well filled, spastic but freely movable throughout its course, with no localized ileocecal tenderness. Screen examination during the administration of a second barium sulphate meal three days later, showed the same condition in relation to the stomach, with a very small six-hour gastric residue. Plates confirm the screen examination. The plates taken of the gall bladder region show no shadows to suggest gallstones but negative x-ray findings do not exclude their presence.

Summary: Taking the screen examinations together with the plates, as far as the x-ray is concerned, the only condition demonstrated is a small gastric residue after six hours, which might either be reflex or functional. Otherwise, the gastrointestinal tract appears to be negative.

Before the operation was performed, another acute attack occurred. The diagnosis, made from the clinical aspect of the case, was an adherent cecum and omen-

tum to the site of the old drainage operation. The operation showed that this supposition was correct. The omentum was adherent along the whole line of the incision. The cecum was attached to the anterior abdominal wall over an area of about four inches in circumference. The stomach, duodenum and gall bladder were perfectly normal. The correction of the pathology cleared up all of the digestive tract symptoms. His constipation has disappeared and his appetite improved. For the six or eight weeks prior to the operation the patient suffered from indigestion, considerable nausea, but no vomiting, and always some distress after eating.

In reviewing these cases not only from the clinical, but from the x-ray standpoint, it seems to me that they should emphasize to us very strongly the fact that it is not wise to lay too much stress on x-ray findings, especially if such findings are opposed to clinical picture.

PROLONGED PREGNANCY*

By Paul T. Harper, M.D., Albany, N. Y.

A

IT IS a matter of experience that operative delivery not infrequently is accomplished with considerable difficulty and is attended by fetal morbidity and mortality that are discomforting where neither actual pelvic contraction nor malpresentation obtains and where the musculature is far from inefficient.

In terms of forces involved, the difficulties arise from increased bony resistance: in terms of anatomic structures concerned, they are occasioned by disproportion between bony pelvis and cephalic extremity of the passenger. In other words, the head is large for the pelvic cavity it has to traverse, and offers in passage the difficulties to be expected of relative pelvic contraction.

Minor degrees of simple flattening, of encroaching ischial spines and of equal contraction, are not uncommon. Although they are instances of actual pelvic contraction, spontaneous delivery is to be looked for when the forces of expulsion are efficient, when malpresentation does not obtain, and when membranes do not rupture prematurely. However, when it is demanded of a particular pelvis, contracted even to a slight degree, that it allow of the passage of a head overlarge, the degree of contraction at once becomes relatively increased. Under such circumstances the contraction readily becomes "marked." It is possible for it to become "absolute."

It is because of the conviction that fetal overgrowth is one of the commonest causes of difficult operative delivery, and that increase in size of the child is inevitable as the date of full maturity is arrived at and labor does not begin, that attention is directed to prolonged pregnancy as a frequent complication of parturition to which, as a clinical entity, first-rate importance should be attached.

The clinical significance of prolonged pregnancy will be grasped and the practical value of determining the date at which pregnancy may be presumed to have arrived at full term made apparent, when the following well-known facts are reviewed.

First, the child gains progressively in weight throughout pregnancy and more rapidly as its end is approached. When continued beyond the date of full term, even more rapid gain is experienced. At seven full calendar months of pregnancy, the approximate weight of the child is 3 lb. 8 oz.; at eight months it is 5 lb.; and at nine 7 lb. 4 oz. Were

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the same rate of growth to persist after full term, the weight would approximate ten pounds at the end of the "tenth month." While such duration of a pregnancy may be inconceivable, the results to the child and possibly to the mother that would follow attempts at delivery of the ten-pound child through an average, or what may be termed a "seven-pound," pelvis may be readily imagined. The ten-pound baby born uneventfully and at term through a "ten-pound pelvis" must not be confused with the one just mentioned. In the former there is no disproportion; while, in the latter, it is absolute even though weight of the child is the same in each case. As might be expected of her, Nature is successful in suiting the size of the child to that of the pelvic cavity; and disproportion is rare provided full term is not exceeded and the pelvis itself is normal.

Second, fontanelles and sutures progressively decrease in size as pregnancy matures and ossification of cranial bones advances. With full term, the latter process continues until the bones not only are larger because of increase in size of the child but also thicker and more closely approximated. For these reasons, they are less easily moulded and more readily broken. Bones that bend at full term are less pliable as pregnancy continues; and relatively sudden blows, that are taken up by sutures and fontanelles at term, invite fractures when applied to bones in which ossification has continued to advance.

B

Prolonged pregnancy obtains when the fetus has arrived at the full period of its maturity and labor has not yet begun; and, to grasp its true significance, it is necessary to understand what "full term" really means.

One of the most interesting features of pregnancy is the series of efforts at accommodation of the maternal organism to the requirements of the developing fetus. As the latter's nutritional demands increase, the yolk sac gives way to the placenta, with the interchange between fetal and maternal blood it makes possible, as a means of supplying them. As the waste products of maternal metabolism increase, hepatic efficiency is heightened in an attempt at their complete neutralization. Until the fetus has developed sufficiently to be able to maintain its body temperature in the presence of the varying ones it meets after delivery, it is maintained in a medium that assures it a constant temperature of approximately 99°. Finally, as the various steps in the mechanism of labor are gone through with, there is afforded a striking illustration of accommodation of size and shape of the presenting part to those of the bony pelvis as the latter is traversed and delivery accomplished.

If the changes peculiar to pregnancy are purposeful, it is reason-

able to assume that the process of labor is of the same nature; and such it can be shown to be. When pregnancy has run its course, the child has developed sufficiently to be able to carry on an existence independent of the mother. However, as far as the child is concerned, intrauterine life could be continued indefinitely provided the inevitable risks of delivery were disregarded. But with the mother the situation is different. There are limits to her ability to care for the waste products of her own metabolism and that of the child; and the presence of toxemia during pregnancy is evidence that these limits too often are reached even before full term. However, more important ones are those presented by the size of the bony pelvis. They are arbitrary: they determine the amount of resistance to be offered to passage of the child through the birth canal: and they are responsible for the mortality and morbidity attendant upon delivery of a child that is overlarge because overdue. Now, in each pregnancy, a time is reached when the child is "large" enough to carry on an independent existence and "small" enough to be born with minimum danger to itself and to the mother. The time is "full term;" and the single process that makes it possible for both conditions to be realized is "labor."

C

While the actual cause of prolongation of pregnancy is failure of the uterine musculature to take on increased and sustained activity characteristic of labor, it is to certain physical states, as a result of which diminished stimulation to contraction is imparted to the uterine muscle, that clinical interest is directed.

To understand why labor may not begin when it should, it is desirable to consider certain factors that contribute toward its onset at full term. Then, presume one or more of the latter to be absent or rendered ineffectual as predisposing causes and it is reasonable to assume that the date of onset of labor may be deferred, and pregnancy, therefore, prolonged.

Periodicity is characteristic of activity of the generative tract from puberty to the menopause, as recurrence of menstruation at regular intervals in all women and of ovulation at intervals that doubtless are fairly regular for the individual, are evidence of. Contractile efforts of the uterus continue throughout pregnancy. Evident in miscarriage, sufficiently pronounced as the uterus leaves the pelvis and becomes an abdominal organ to be of value in differentiating between pregnancy and uterine new growths, they possess force sufficient to bring about engagement as pregnancy advances and to occasion the patient pain as its end is approached. Activity of uterine muscle presents periodicity characteristic of the menstrual cycle and, as the tenth menstrual

month is finished, contractile efforts suddenly increase in frequency and efficiency, and labor begins.

But labor may begin spontaneously before completion of the tenth cycle; and, again, time of its onset may be deferred. Further, labor may be induced successfully before the end of the tenth menstrual month. The foregoing prove that, regardless of what may be termed the tendency of uterine muscle to assume activity characterized as labor, other factors contribute to the actual onset of labor. Two of them give such evidence of their importance that they may well be considered.

First, progressive increase in size of the uterus, due to growth of the child and gradual accumulation of liquor amnii, continues until the onset of labor. The lowering of the level of the fundus that accompanies engagement obviously results from sinking of the whole uterus rather than from any decrease in amount of its contents. A limit to the distention of which the uterus is capable without its responding with contractile efforts sooner or later is reached. Characteristically this point is arrived at as 280 days or ten menstrual months have elapsed since the beginning of pregnancy; and, at this period of heightened activity of uterine muscle, the contractions of labor may be expected to appear.

It is the distention the uterus is subjected to long before full term that accounts for the prematurity of labor so common in multiple pregnancy. If spontaneous labor may be set up early because the uterus is large, it is reasonable to conclude that, were the uterus underdistended either because of size of the child or of the quantity of the liquor amnii, labor might not begin even though ten full months of pregnancy had been gone through with; and that deficiency in the amount of liquor amnii possibly is a predisposing cause of prolonged pregnancy.

Were the failure in onset of labor due to slow growth of the child, actual difficulty due to disproportion would not be encountered in delivery. Nevertheless, under these conditions, ossification has been noted to progress to such an extent as to interfere with moulding necessary for spontaneous or uneventful operative termination of labor.

Second, the onset of labor finds the presenting part fitted more or less firmly into the lower uterine segment. Even though the former is unengaged and the cervix is high up, the latter is shortened as it and the lower segment are pulled upward against the presenting part; and not infrequently the internal os is quite completely obliterated at the onset of active labor.

As the end of pregnancy is approached, it follows that cervix and lower segment are receiving more or less constant mechanical stimulation. Two clinical conditions may be cited to prove that pressure on

the lower segment is an important factor in bringing about the onset of labor.

In the first place, the introduction of a hydrostatic dilator invariably gives rise to uterine contractions that persist until the irritant is expelled or until it has produced all the dilatation of which it is capable; while, in the second, the association of premature labor with cases in which the presenting part reaches the lower midpelvis soon after engagement and where the pelvis is contracted at the outlet, particularly as a result of encroaching ischial spines, is so frequent that one may conclude that pressure outside the lower segment, exerted by spines and other bony prominences, and that within the uterus, exerted by the low presenting part, contribute to the onset of contractions that result in delivery. The appearance of physiologic contractions following introduction of an elastic dilator is positive proof that labor will begin and will continue, provided mechanical irritation of the cervical ganglia is maintained, even though full distention of the uterine cavity has yet to occur and the conventional 280 days of pregnancy have yet to be run.

The foregoing clinical fact not only establishes lower uterine segment stimulation as the most important of the factors mentioned in bringing about the onset of labor; but it also affords ready explanation of the fact that multiparæ so frequently go beyond term and, again, that prolonged rest in bed late in pregnancy tends to defer the date of onset of labor.

It is so characteristic for multiparæ to exceed full term by a short period that it is common practice to add to the expected date two or three days for each previous pregnancy when computing the time of probable onset of labor. The fact is explained on the basis of failure of the presenting part to engage and descend and, thereby, to subject cervix and lower segment to more or less constant and increasing pressure as the onset of labor is approached. Often the presenting part begins its journey through the pelvis only as labor progresses. When the unsupported fundus is directed well forward, as occurs in the pendulous abdomen, the presenting part not only is not directed into the pelvic inlet before labor but often remains high as the latter progresses. For these reasons, the pendulous abdomen, a condition frequently associated with multiparity, tends of itself to postpone onset of labor.

In another type of case actual prolongation of pregnancy is encountered with a frequency that relatively is great. When, because of associated medical or surgical conditions, the patient is forced to remain in bed for a considerable period late in pregnancy, uterine muscular activity may be expected to be less pronounced than when she is leading an ordinarily active life. Further, cervix and lower

segment are denied the stimulation from more or less firm contact with the bag of waters and the presenting part that assumption of the upright position occasions. For these reasons, the date of spontaneous onset of labor not infrequently is deferred.

D

Since pregnancy is prolonged as the date of full term is exceeded, diagnostic efforts logically should be directed toward determining the date of full maturity in each instance. At full term the child is ready to leave the uterus; while, beyond this time, it continues intrauterine existence at progressively increasing risk to itself and to the mother, as physiologic balance between passenger and pelvis is more and more disturbed.

The fully matured child presents the following characteristics: Its weight is from 7 to 7½ pounds; its length is approximately 20 inches; bones of the head are firm; cheeks are full, giving the face a rounded appearance; subcutaneous fat is sufficiently abundant to occasion creases of varying depth at the larger joints; lanugo has disappeared and vernix is distributed over the back and in the deeper skin folds; nails project beyond the finger tips; testes have descended into the scrotum; and labia majora are prominent.

The foregoing establishes a standard by which actual prematurity can be judged. The overterm child is longer and heavier, its anterior fontanelle is smaller, and it "looks" older than one born on the date of full maturity. So truly does the child reveal its age that the ten-pound baby born at term through a "ten-pound" pelvis looks younger than the "nine-pound" child born two weeks beyond full term through a "seven-pound" pelvis.

While the statement that full term is attained as the fetus has fully matured is a physiologic fact, it is of little practical value as a guide in determining the approximate date upon which labor should begin. However, as is true of all physical states, full term subscribes to certain more or less fixed standards by which its existence can be judged. These standards are specific, in contradistinction to a physical state that cannot be investigated directly; and they supply the evidence upon which the date of full maturity is fixed.

Pregnancy may be presumed to mature 280 days after impregnation; and the matter of fixing the probable date would be simple were it known just when conception occurred. However, there is no way by which the exact date of impregnation can be determined and, even in the exceptional case where it is known, the time of full term can be computed with no more than approximate accuracy because, with some, pregnancy matures in less than 280 days, while with others the conventional period is exceeded.

Although there is no single computation on the basis of which the date of full term in the particular case can be fixed, the application of a single rule makes it possible to determine what may be called a "date of expected confinement." Why the addition of nine months and seven days to the first day of the last menstrual period gives a date of full term that is approximately accurate in the majority of instances is apparent when the principles upon which the rule is based are considered. It is known that the ovum is fertilized in the tube; and it is thought that the phenomenon occurs early in the course of its passage through the tube. If the latter premise is correct, ovulation precedes fertilization by but a short interval of time. Now the appearance of a freshly-ruptured corpus luteum in approximately 75 per cent of patients operated upon on the first day of a menstrual period offers clinical evidence that ovulation and menstruation are synchronous in the majority of cases; and makes reasonable the conclusions that pregnancy, as often begins at or very shortly after onset of the last period and may be expected to terminate 280 days, or its approximate equivalent, namely nine calendar months and seven days, from that date.

But ovulation and menstruation are not synchronous in approximately 25 per cent of the patients; and, with the latter, labor begins earlier or later than the "expected" date as ovulation and fertilization precede or follow the last period. Were they to occur, for instance, in the midmenstrual period, pregnancy would be counted from the preceding period since the subsequent one doubtless would be suppressed; but labor would not terminate until two weeks beyond the date of expected confinement computed on this basis. However, pregnancy would not have been prolonged; and the conventional size and development of the child would give evidence of the fact.

On the other hand, were ovulation and fertilization to occur a few days later, that is, within six or eight days of a period, the latter might and probably would not be suppressed although it might be expected to be atypical as to quantity or duration of the discharge. If the latter symptoms either were not elicited or were interpreted incorrectly and the period considered physiologic, the date of full term would be computed from it and pregnancy would terminate approximately a week before the expected date. But here, from size and development of the child it would be evident that labor was not premature.

Since in each instance the child gave evidence neither of more nor less than full maturity, it is reasonable to assume that pregnancy terminated at the expiration of the physiologic period of 280 days from the date of impregnation, and that the prematurity on one hand and the prolongation of pregnancy on the other are apparent rather than real. Further, since in one instance the date of expected confinement was anticipated a week and in the other deferred twice as long, the

conclusion that the "date" in neither case was correct is logical. The error in computing the first date arose because ovulation (and impregnation) followed menstruation by a considerable interval and pregnancy did not date from the beginning of the last period as was assumed. With the second date, error arose because the patient menstruated once after conception occurred, a fact that was not considered either because the history of the "last" period was not carefully elicited or was incorrectly interpreted. These instances prove nothing more than that the "nine months-seven days" principle has limitations: they emphasize the wisdom of employing it as a guide to rather than an arbitrary rule for determining the date of full term.

There are further limitations to the above-mentioned rule that assumes the duration of pregnancy in each case to be 280 days, or ten menstrual months. The menstrual cycle not infrequently is less than twenty-eight days and but little less often the period is exceeded. Experience proves that, although patients who menstruate every twenty-six days do not as a rule anticipate the date of expected confinement by as much as the difference between 260 and 280 days, it is not unusual with them for labor to begin on a date that apparently is premature. No less frequently, patients whose periods return at intervals of from thirty to thirty-five days exceed the date of expected confinement. In the first instance labor is not premature, neither in the second is pregnancy actually prolonged if a fully developed child of a size corresponding to that of the pelvis is considered the basis for full maturity; and, for purposes of labor, such is the standard.

Irrespective of frequency of the menstrual cycle, pregnancy may terminate in less than 280 days from the first day of the last period and, therefore, from the probable date of ovulation. Clinical proof of this is offered by the occasional case where, although onset of the last period occurs early in the month and first intercourse takes place several days later, labor terminates in the birth of a fully developed child 280 days from the beginning of the last period rather than from the date of intercourse. In fact, this experience so frequently is met in patients who become pregnant immediately after marriage that computation of the date of expected confinement from the last period and, at the same time, statement of the reasons for such a procedure are precautions that may well be taken.

On the other hand, it might be assumed that no less often pregnancy requires more than 280 days for its full maturity. The birth of a child, presenting no evidence of overmaturity, a matter of days or even of one or two weeks beyond the expected date already has been accounted for on the basis of ovulation (and impregnation) occurring at a corresponding interval after onset of the last period. As readily it could be explained on the basis of a more slowly maturing pregnancy. But,

for all practical purposes, it is immaterial which is the correct explanation; because in neither case had the child fully matured at the expected date of confinement, and in neither was the induction of labor called for. In each, labor began spontaneously when full term was reached.

Due to inability to determine the actual date of impregnation and again to the possibility of variations from the normal in duration of pregnancy, errors of several days in fixing the date of spontaneous onset of labor may be expected in a large percentage of cases where the "nine months-seven days" rule is applied. It is a matter of experience that the date is approximately correct in better than one-half of the cases. Far from proving the rule to be valueless (as a matter of fact there is no other as dependable), the last statement establishes the necessity for supplementing it by other observations, especially by those that make it possible to measure progress in development and to determine the approach of full maturity and the physiologic balance between passenger and birth canal that is characteristic of it.

Of these observations there are three that demand attention. They are, first, the earliest date upon which "life" is definitely felt; second, height of the fundus at an arbitrary period in the course of pregnancy; and, third actual comparison between size of the head and the available diameters of the bony pelvis.

In primiparæ, "life" rarely is felt before pregnancy is four and one-half months advanced; while, in multiparæ, activity of the fetus commonly is noted at the end of the fourth month. For reasons that are apparent, patients whose abdominal walls are thin and those who are alert to the situation are conscious of movements of the fetus at earlier periods than those possessing thick and muscular walls and those who are indifferent. Recording the date of "quickening" and proper interpretation of it are two of the minimum requirements of obstetric history taking.

Regardless of parity of the patient, the fundus progressively rises until, at the end of the fifth month of pregnancy the approximate height of the umbilicus is reached. The diagnostic value of determining fundal height at this time is greater than at any other period for the reason that the upper uterus, supported in the longitudinal axis of the abdomen by the round ligaments, now is directed well forward by the lower vertebral column. Earlier, it rises from the pelvis more slowly as the pelvic floor is relaxed, and as the uterus is in retroversion. Later, its height, measured by distance above or below the umbilicus or below the ensiform, varies with engagement, amount of liquor amnii, and with "waist length." For reasons given, real diagnostic importance may be attached to the fact that the fundus has reached the umbilicus; while much less may be accorded the observations that it

either is three inches above the symphysis or possibly two below the ensiform.

The third observation is interesting in that it is of greater clinical value in the individual case than either of the preceding, although it is less often made use of. Bearing in mind that a full-term passenger and pelvis normally are in proportion, and that thereafter disproportion appears and increases, clinical full term could be diagnosed with precision were it possible to compare the available pelvic diameters with those of the child's head. Were engagement and descent to occur during the last month, such comparison not only is impossible, for obvious reasons, but it is unnecessary since engagement and descent are proof that no disproportion existed at least at the time the presenting part entered the pelvic cavity and that subsequent moulding can be counted upon to compensate in great measure for progressive increase in size of the presenting part.

On the other hand, were full term approached and the presenting part found unengaged as a result either of a slight degree of simple flattening or of multiparity, a comparison of approximate diameters not only is possible, but is imperative, if any doubt as to the date of full term exists. In no other condition is there as great need for such precaution as in presentation by the breech where, in the first place, pregnancy not infrequently is prolonged and, in the second, the unmoulded head must engage, descend and be born in an interval of four or five minutes following appearance of the umbilicus. Fetal mortality in breech presentation, where disproportion, due to prolonged pregnancy exists, and where spontaneous labor is awaited and vaginal delivery attempted, is as high as it is because of blind faith in Nature's ability to institute labor "when the time comes." Under such conditions, even a rough comparison between head and pelvis should convince the physician that vaginal delivery is out of the question.

The methods by which the available pelvic diameters are determined with approximate accuracy are familiar. "Spines," "crests," the external oblique and external conjugate diameters can be measured easily and conclusions as to the available internal diameters readily drawn. Measurement of the occipitofrontal and biparietal diameters of the head is less accurate since allowance has to be made for thickness of abdominal and uterine walls. However, in the case in which such observations are necessary and the head sufficiently high for the pelvimeter to be applied to its anteroposterior diameter, the latter's length can be measured and, provided sufficient allowance for the intervening soft parts is made, the biparietal computed with approximate accuracy by applying the following simple rule: subtract 2 cm. from the length of the occipitofrontal diameter when the latter is

11 cm. or under and 2½ cm. when its length is over 11, and the result gives the approximate length of the important biparietal.

Cephalometry and pelvimetry may be of little value in determining when pregnancy in the individual case has reached full term. They are invaluable when pregnancy is prolonged, since it is through them that standards of treatment are established.

E

The onset of labor, even in neglected cases of prolonged pregnancy, can be counted upon sooner or later to be spontaneous. In other words, "natural" forces institute the process. In that they are set up unaided they are natural; but, in that they fail to become active when they should, they are unnatural. Failure in onset of labor at full term then is pathologic and demands suitable active treatment.

If heightened morbidity and mortality attend vaginal delivery when pregnancy is prolonged until spontaneous onset of labor brings it to an end, it is reasonable to assume that method of delivery and distance the date of onset is postponed are in great measure responsible for the results; and it is logical to conclude that the latter can be improved as proper choice of the method of delivery is made and as the onset of labor is not left wholly to Nature.

As a means of terminating any pregnancy, it is insisted that vaginal delivery may be attempted only as the child's head, aided by the advantages the physiologic mechanism of labor offers, can be made to accommodate itself with approximate accuracy to the size of the bony pelvis. When active interference in prolonged pregnancy is demanded, relative pelvic contraction makes the vaginal route more and more unavailable. It follows that equally as important as what you do is when you do it; and that a procedure meeting the requirements of the case today might involve positive dangers to the child were it to be carried out a week later. To illustrate: a skilfully conducted breech extraction done ten days beyond full term not infrequently results in loss of the child from the impossibility of bringing a "large" after-coming head through a "normal" pelvis. Though no criticism of the way the particular operation was done may be made, there is great question as to the wisdom of having even attempted it. Presume the same skill to have been used at full term: the result of the extraction doubtless would have been satisfactory.

From what has preceded, it is apparent that a pelvis presenting normal, or but slightly restricted, proportions at term becomes absolutely contracted when pregnancy is sufficiently prolonged.

Were this principle firmly fixed in mind, Nature far less often will be left to accomplish the impossible; and there will be substituted for a policy that does nothing more than "await" the inevitable, one that is truly expectant in that it allows the process to proceed only so far as vaginal delivery is safe and, when that period is passed, calls for

the termination of pregnancy by elective, abdominal section. Such an attitude in itself is conservative; and may be counted upon to spare mother and child the dangers of all needless operative interference.

Upon assuming care of a case, the date of expected confinement presumably has been computed from the menstrual history. Further observations along lines already discussed confirm the date or indicate that full maturity will have been arrived at either before or after it. The date to be fixed in the physician's mind is that of clinical full term, at or shortly after which disproportion may be expected to appear; and the course to be followed is indicated by extent of the disturbance of physiologic balance between head and bony pelvis.

If the presenting part is deliverable, labor may be induced. However, it must be remembered that the unmoulded head of a nine-pound breech may be undeliverable, while a child of the same size advancing through the same pelvis but by the vertex may be born with little difficulty.

If expectancy is decided upon because of doubt as to whether or not full maturity has been attained, it must be borne in mind that the vaginal route becomes more and more unavailable as interference is postponed. Just how unavailable, comparison of pelvic and fetal head measurements proves; and such comparison is easy when the presenting part lies above the pelvic inlet. The safety that lies in the fact that the presenting part already is deeply engaged is apparent rather than real; for advancing ossification not infrequently makes impossible the increased moulding necessary for the growing head to be delivered spontaneously, and invites cranial injuries when operative termination is demanded.

When marked disproportion exists, induction of labor is contraindicated and abdominal section is to be employed. The operation may be done at once or the onset of spontaneous labor awaited, since the amount of disproportion may be disregarded. In either case it is an elective procedure in that it is done from choice and upon a patient who has been subjected to no vaginal manipulations and, for this reason, upon a case that may be presumed to be a "clean." There is a peculiar advantage to be gained by awaiting spontaneous onset of labor before section is done. It is found in the improved drainage that is afforded by the slight dilatation produced by beginning labor. Mortality and morbidity following abdominal section performed under such conditions is negligible. Much less satisfactory results attend the operation when done after repeated and unsuccessful attempts at vaginal delivery have lowered the patient's resistance and possibly have introduced into the generative tract bacteria that produce no more than local and self-limited reactions when the process is limited to the endometrium but that occasion results of an entirely different nature when the peritoneum is contaminated.

When full term maturity has been reached and labor does not begin, and when continuation of pregnancy may be presumed to make delivery increasingly difficult, induction of labor is a conservative procedure. Just what method shall be employed depends almost entirely upon condition of the cervix, in other words, upon beginning or more or less complete obliteration of the internal os and corresponding thinning-out of the lower uterine segment.

The latter are manifestations of uterine action already going on; and, when present, call for simple measures that increase frequency and intensity of contractions until complete dilatation of the cervix and subsequent advance of the child are accomplished. On the other hand, when the internal os is unobliterated and the lower segment thick, practically all of the work of labor as far as the cervix is concerned remains to be done; and the measures to be employed are those that not only institute contractions of the kind characteristic of early labor but that keep up activity of the uterus until delivery is brought about.

These groups represent the extremes when it comes to the induction of labor. With the former, labor begins after the familiar dose of castor oil, or it follows partial digital dilatation of the cervix and artificial rupture of membranes in suitable cases; while, with the latter, even a second and larger hydrostatic dilator is required to open the cervix sufficiently to permit of delivery by forceps. Because the method to be employed is determined almost entirely by the condition of the cervix, there is no way to induce labor; and principles rather than procedures are the guides upon which successful conduct of the operation depends.

F

In what has preceded, it is insisted that the writer does not propose the arbitrary termination of labor in each instance because "a date" has been reached and labor has not begun.

What he has purposed to establish is: first, that in each pregnancy there is attained a period when, in the interests both of mother and child, the latter should be born: second, that this period is attained as clinical full term, which may be defined as a state the existence of which can be determined with fair accuracy by careful history taking, close observation of certain physical signs and proper interpretation of them: and third, that, while pregnancy need not arbitrarily be terminated in each instance when full term is not accompanied by spontaneous onset of labor, the process is allowed to continue uninterrupted only as progressively increasing risks to the mother and particularly to the child are incurred.

Finally, it is written in the hope of inspiring increased interest in a frequent and serious complication of parturition.

THE X-RAY AS AN AID TO OBSTETRICIANS*

By A. Y. P. Garnett, M.D., Washington, D. C.

THERE is no branch of surgery in which an exact knowledge of conditions and an accurate diagnosis are more essential than in obstetrics. Unfortunately the obstetrician has no absolutely accurate way of determining the factors which govern and control birth. All estimated diameters of the internal pelvis are relative; likewise the estimated diameters of the fetal head. So it is remarkable that we are able to successfully and intelligently judge the outcome of a large majority of cases. We have often seen obstetricians who are gifted with what may be called obstetrical judgment developed to a remarkable degree, and while we admire the individual, yet we are impressed with the fact that inaccurate methods and lack of definite knowledge permit this one man to apparently outguess another.

"Will the passage accommodate the passenger?" is by far the most frequent and important obstetrical question. We will have no positive answer until we can definitely determine the exact measurements and degree of moulding of the fetal head and the maternal pelvis. The diameters of the external pelvis used today give us great aid in determining the relative diameters of the internal pelvis, but they are not accurate, and we too often allow a test labor to occur before determining upon a definite method of delivery. This is an acknowledgment of lack of scientific and accurate information. There is not an obstetrician who cannot recall cases, especially those of borderline type, in which a certain method of delivery was attended with poor results and in which he afterwards realized that more accurate knowledge would have prompted another method of procedure, and that the outcome might have been successful.

There has been very little written and only a few cases have been reported in which the x-ray has been used as an aid to diagnosis in obstetrics, yet in all cases which I have been able to find in which it has been used the x-ray has proved of material benefit. As yet there is no method of determining the exact diameters by means of the x-ray, though Guilbert[1] endeavors by geometrical deductions to determine them; also Van Allyn[2] shows originality in his deductions upon the measurements of the conjugate diameter, but their conclusions are too theoretical for general use. A practical and accurate method is yet to be worked out.

However, with the new Potter-Bucky diaphragm it is only a question of a short time before this will be done. The old methods of taking

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obstetrical x-ray pictures proved unsatisfactory, often on account of the haziness of the pelvic outline and especially of the fetal head. Pictures taken with the Potter-Bucky diaphragm show the pelvic brim clearly and well defined, and the fetal head can be easily seen and diagnosed even in its pelvic position. We know accurately the external landmarks, so by pictures of these with the aid of parallel lines, both antero-posterior and lateral, we should be able to determine the measurements of the superior straight.

The difficulty met with in taking these measurements depends upon the inclination of the pelvic plane and the varying distances of the plate and tube from the pelvis. A method of placing the plate parallel to the plane of the inlet, suggested by Kehrer and Dessauer,[3] and showing lines of known dimensions occupying the space which corresponds to the opening of the inlet should give accurate measurements. A method based upon this suggestion is being worked out at present, and promises to be successful. These diameters should be determined before the head engages in the pelvis as otherwise the pelvic brim will be obscure. The diameters of the fetal head can also be measured more accurately by this method than by any other used up to the present time. In this way it can be shown fairly definitely, therefore, whether the head can or cannot pass through the superior brim. The diameters of the outlet can be determined more easily by pictures with the pelvimeter in place.

The knowledge obtained in this way will be of material help to the obstetrician in determining the method of procedure in an operative delivery. There are cases in which it is difficult to determine by other means the measurements of the pelvis and the fetal head, and also to diagnose correctly the position. Hydramnios, multiple pregnancy extensive edema, nervousness, hypersensitiveness interfering with proper examination, hydrocephalus, and monstrosities are some of the complications which interfere and in which the x-ray may be a great help in diagnosis. Likewise, in primiparæ, especially in borderline pelves, where posterior positions are suspected, a picture will be of definite assistance.

The x-ray can be of as great benefit in obstetrics as in many other branches of medicine. Its aid should be sought oftener by obstetricians in borderline cases. We are only recently beginning to use it and to realize its possibilities. I believe that in a comparatively short time a method will be worked out by which the diameters can be determined accurately. This will make the x-ray a necessity in all complicated cases of labor.

The use of the x-ray in the following cases gave me material aid in arriving at a diagnosis and in determining the procedure to be employed in delivery.

CASE 1.—This patient had been delivered a few years previously of a large baby, stillborn. The delivery was difficult and prolonged. Examination showed a relatively flat pelvis. An external examination was made with difficulty on account of excessive fluid, intensely sensitive abdomen and an excessive amount of fatty tissue, and a diagnosis of the presentation and position was impossible, though the head was apparently toward the pelvis. The amount of engagement was difficult to determine. Vaginal examination was of little help on account of the swelling, pain, closed cervix and high position of the head. The patient was about two weeks short of term and an accurate diagnosis was important in order to decide whether to induce labor. The x-ray showed a child near term with the head in posterior position, and partially engaged, and no great disproportion between head and pelvis. Labor was induced with bags, the head rotated normally, and she easily delivered herself. The picture in this instance helped to make a correct diagnosis and made me more confident of the ultimate outcome. Since then I have induced labor again in this same patient with similar results.

CASE 2.—Mrs. C., Para 3. Came under observation at the beginning of the ninth month, having been referred by the family practitioner who suspected some abnormality. External examination showed a woman about eight months pregnant. The small parts could be felt to the right, the breech apparently above. There was an excessive amount of fluid, and apparently no engagement, as the child's position could be changed easily. No head could be felt either above or below. Above the brim the examination showed what felt like a breech. There was one fetal heart heard and the point at which it could be heard best could easily be changed by changing the position of the fetus. Diagnosis lay between twins, a monstrosity or a small baby with head posterior and difficult to find. I made the diagnosis of a monstrosity and the x-ray examination confirmed this diagnosis. The question then arose as to whether labor should be induced in order to save the patient a month of anxiety, or whether the patient should be allowed to go to term and be delivered of a monstrosity. The latter course was adopted. The patient went into labor herself in about two weeks and was delivered of a monstrosity. The x-ray was of great help in this case in confirming the diagnosis. While of no value in handling this particular case, it might be of help in deciding the procedure to be adopted in similar cases.

CASE 3.—External examination in this case was most difficult and it was impossible to diagnose the position of the fetus on account of the excessive amount of fluid and a very tense and tender abdomen. All signs pointed to an abnormality. An x-ray examination showed twin pregnancy. The two heads were side by side and presented toward the pelvis; there was no engagement. With this information the diagnosis was clear and in consequence the case was handled successfully.

CASE 4.—A case of Dr. Pagan's and reported through his courtesy. A primipara; in labor several hours, with no dilatation. The diagnosis was uncertain. The patient was nervous, excitable and rather exhausted. An x-ray examination disclosed twins; both large, neither head engaged; both heads towards the pelvis. It was decided to do a cesarean section, and the case was handled successfully. Without the aid of the x-ray in making a correct diagnosis the delivery of this woman would no doubt have been an "accouchement forcé" with in all probability a more serious outcome.

In a case seen more recently in consultation there was some doubt as to the exact position of the head, and the woman had been in labor

for forty-eight hours. The membranes had ruptured; the cervix was fully dilated; the head R. O. T.; the bones of the skull overlapped so that neither fontenelle could be definitely determined. She was delivered by Scanzoni maneuver, but not before it was necessary to diagnose the position by feeling the posterior ear. An x-ray would have done away with this examination and lessened that woman's chances of infection.

In another case a diagnosis of triplets was made before birth where it would have been absolutely impossible to have diagnosed the case correctly without the use of the x-ray.

In conclusion, it may be said that the x-ray has not been sufficiently used in the past as an aid in diagnosis chiefly on account of the inability to get clear and definite pictures. Today, however, with the Potter-Bucky diaphragm this trouble is eliminated. It should be employed in all doubtful cases as it cannot possibly do any harm and in a large majority of cases it will be of great help. The measurements of the pelvis will eventually be accurately determined by this means. As yet a perfectly satisfactory method of application has not been worked out, but it is only a question of time before some method will be discovered by which the measurements of the internal pelvis can be correctly determined. These measurements can never be accurately determined in any other way. The use of the x-ray has been neglected in the past but undoubtedly will be used more frequently in the future and with better results.

REFERENCES

(1) Ann. de gynec. et d'obst., 1918-19. (2) Am. Jour. Roentgenol., 1916, 3. (3) München. med. Wchnschr., January 6, 1914, lxi, pp. 22-25.

The following also refer to the above subject:

Hess, J. H.: The Diagnosis of the Age of the Fetus by the Use of Roentgenograms, Am. Jour. Dis. Child., 1917. *Bartholomew, Barnes and Galloway:* Diagnosis of Pregnancy by the Roentgen Ray, Jour. Am. Med. Assn., May, 1921. *Robinson, G. D.:* Skiagram of Foreign Body in Gravid Uterus—Reported Before Section Obst. and Gynec., Royal Society Medicine, Dec. 5, 1919. *Warnekros, Kurt:* Schwangerschaft und Geburt in Roentgenbilde, 1918, Wiesbaden, Bergmann. *Mackenzie, W. R.:* Remarks on Roentgenographic Pelvimetry, Brit. Med. Jour., 1918, pp. 1-612. *Sangmeister:* Schwangerschaft bei Rœntegenamenorrhea, München. med. Wchnschr., 1917, lxiv, 1178. *Riddell, J. R.:* Measurement of Pelvic Diameter by the Roentgen Rays, Brit. Med. Jour., 1907, pp. 636-638.

PREMATURE SEPARATION OF THE NORMALLY IMPLANTED PLACENTA*

By Burnley Lankford, M.D., F.A.C.S., Norfolk, Va.

THIS condition constitutes one of the most serious emergencies with which those of us who practice obstetrics have to deal. "Emergency" is the correct term to use in this connection, because we have no method (at least so far as my knowledge extends) by which we can either foretell or prevent it, and we have no definite, standardized method of treatment, to lend us confidence. Experience has always been and will always be the best teacher, and the occurrence of this condition is rare enough to be met with only occasionally by the man in general practice, occasionally by the man who limits his work to obstetrics, and frequently, only by those who work in the clinics of the great cities. Therefore we seldom have the benefit of extensive personal experience, gained through the accumulation of cases, to guide us in this difficulty, and every paper on this subject, should be of some interest. The incidence is variously estimated, from 1 case in every 100, to 1 case in every 250 pregnancies. I believe the latter is nearer the truth.

Rigby, an English physician, who lived some hundred years ago in the small town of Norwich, wrote very fully on this subject, as well as on Agriculture, and Professor Bard, of Columbia University, who was the first American to write a text book on Obstetrics, wrote on this subject (as well as on Agriculture!). Goodell should also be well remembered in connection with premature separation of the placenta. He recognized it as a most grave condition, and thirty-five years ago, placed the maternal mortality at 50 per cent, and the fetal at 94 per cent. Present day authorities place the mortality, both maternal and fetal, at somewhat lower figures, but still high enough to prevent sleep when we are engaged with such a case.

However much has been written about the probable causes of premature separation, the fact remains that we do not know just what they are. The consensus of opinion seems to be that there is some underlying toxemia, in turn producing an inflammation of the placenta, or of the uterine muscle, in the presence of which, during the last two months of pregnancy, (when the placental attachment is normally less intimate) external causes, such as direct trauma, falls, or overwork; internal causes such as short cord, vigorous fetus, may induce the onset of separation, and the first blood clots, acting as a foreign body, may cause contractions and further detachment.

*Admission Thesis.

There are two main types, often merging, the one into the other. In one the hemorrhage becomes external and visible: in the other the hemorrhage remains concealed. As a rule, the concealed hemorrhage, after a time finds its way down between the membranes and the limiting wall of the uterus into the vagina, finally becoming external, so that there is no real difference, so far as the pathologic origin is concerned. The larger, the more continued the hemorrhage, the more likely it will be to appear in the vagina, and hence it would seem to follow that the more serious cases would be those of the external type. This may or may not prove true. It is true that the external hemorrhage serves as a danger signal, puts us on the watch, makes us observe the patient more closely, starts us looking for the cause, and for these reasons the external type may prove less dangerous for the patient. Close examination of all placentas will show evidence that an appreciable number had a slight separation at some time during the pregnancy, not sufficient perhaps to have come to our notice or to attract the patient's serious attention. On the other hand, a concealed hemorrhage may be of such magnitude as to cause the patient's death, without any blood becoming visible in the vagina. This may happen where there is a fundal implantation, the uterine muscle being thin and of poor tone, is stretched to the point where it tears and blood escapes under the peritoneum. Very rarely, the rupture may be through the peritoneal coat, the blood becoming free in the peritoneal cavity. In another case, the placenta may be attached low, (not low enough to be a previa) its lower edge may become detached and the blood soon find exit in the vagina, the condition never becoming serious clinically. With such low detachment a large clot would not be so likely to form before the blood reached the vagina and the pressure became relieved: hence this type of detachment is not likely to become extensive. By far the greater number of premature detachments occur during the last two months of pregnancy. Just why this should be so seems to be unknown, but would lend force to the theory that some toxemia is a predisposing condition, whether the toxemia be of metabolic, syphilitic or other origin, because, most of the toxemias develop in the latter months. Thus ensuing most often after the fetus has reached a stage of viability, and the mother has come to look upon her unborn child as sure of existence, this accident fraught with such a heavy mortality to the fetus, often becomes an obstetric catastrophe.

Whenever we are confronted with bleeding from the vagina during the latter months of pregnancy, we must distinguish between premature separation of the normally implanted placenta and placenta previa. It may not be possible to do this without a vaginal examination, and should this become a necessity, it should always be remembered that an abdominal section may later become the best method

of treatment. A vaginal examination should be made only under the most rigid aseptic and antiseptic precautions, and if possible should be limited to one, bearing in mind the while, that all possible information to be gained by this route should be acquired at that time, so as to free the patient from the risk of repeated vaginals, in the event of a later section. The history of the onset, a careful and gentle abdominal examination with recorded findings, followed by a rectal, should always be made in the effort to establish a correct diagnosis. In some cases we can exclude placenta previa by rectal and abdominal examinations, and if the woman does go on to a cesarean, we have not added vaginal examinations to her risks. In trying to make a diagnosis by abdomen, the following points will prove helpful.

In premature detachments we may expect to find a uterus that is not only hard, as hard as during the severest contractions, but also one that does not soften intermittently, remaining in the state of so-called "boardlike" hardness. Whoever first applied that adjective to this condition, certainly chose an accurate one, because boardlike the uterus does feel, and the sign is almost (if not quite) pathognomonic. This should go far towards establishing the diagnosis of a prematurely separated, but normally located placenta. Palpation should be gentle, for three reasons at least: first the abdomen is usually quite tender, and all palpation poorly borne, and if not very gentle, defensive reflexes will be set up that will go far towards interfering with the information we wish to elicit; second, there is often an area of greatest tenderness, and where the whole abdomen is tender, this particular area may be overlooked, if palpation be rough; a third reason for gentle palpation seems to me this: we do not know whether the bleeding is continuing or whether it may not have ceased, and rough palpation may dislodge clots from the vessels and start bleeding afresh. Some authorities advocate massage of the uterus as a part of the treatment in the effort to make the muscle contract; however, when we bear in mind the pathology, it seems to me that it is safer and better to handle the uterus gently.

Careful inspection of the abdomen may show a protrusion of greater or lesser prominence, and if that prominence be quite tender (exquisitely so in some cases) we may fairly infer that the placenta and the hemorrhage are under that area. The above signs, brought out by inspection and palpation, will prove true only if the placenta is attached on the anterior, anterolateral or fundal portions of the uterus. If it be attached posteriorly, or posterolaterally, we may expect to find the same boardlike hardness and general tenderness but not the area of prominence and supertenderness. These signs and symptoms being present, placenta previa should be excluded without vaginal examination. By rectal examination we should be able to tell in most

cases whether the cervix has been obliterated, how much the os has opened, whether the membranes are intact or ruptured, whether the presenting part has been well driven down and whether the cervix feels uniformly thin around its circumference, or whether some segment feels thick and boggy, suggesting a low placenta. If the presenting part has been well driven down so that it plugs the lower uterine segment, a point of some diagnostic importance is that lifting the head so that the plugging effect is momentarily overcome, will cause a sudden marked increase in the vaginal bleeding. This is not so likely to be the case with a placenta previa, because the blood, its source being lower, is more apt to find its way out continuously and not become dammed back upon its original source higher in the uterus, through the plugging effect of the head in the lower uterine segment, the head being *below* the placenta. If abdominal and rectal examinations have not served to establish a working diagnosis, we are justified in making a vaginal, under conditions of surgical cleanliness. The end of all study and diagnosis should be for the beneficial treatment of the patient, and granted that we are suddenly faced with this obstetric difficulty, how shall we treat it? A number of factors should be considered before we can decide upon a rational plan.

What is the approximate period of gestation? Is the fetus living? Is the patient a primipara or multipara? Is she in labor? What is the condition of the cervix, the os? Is the muscle tone of the uterus good, fair, poor, or apparently lost entirely? Is the hemorrhage external or concealed? Has it been severe and is it continuing, or has it stopped, for the present, at least? What is the general condition of the patient? Can the patient be given minute attention (literally minute by minute) under good surroundings? Is hospital treatment available? These questions should be answered when the patient is first seen, if it be possible, and others as the condition progresses, as further signs and symptoms become manifest. If the fetus should have reached a viable period, and *is living,* the mother very anxious for a child and willing to take the chances of operation, abdominal section will probably be safest for the child and quite as safe for the mother, in good surgical hands. If the patient be a primipara, not in labor, thick cervix and closed os, if after close watching for a reasonable time, the bleeding does not cease, or apparently becomes more profuse (external type), if concealed and the uterus continues to grow larger, with no tendency to intermittent contractions, showing loss of tonus, the hemoglobin falling progressively, the pulse going up, undoubtedly section should be the choice, in the interest of both mother and child. These are the two classes in which we may feel safe in advising abdominal section, provided the patient can be given the benefit of a standard hospital, or its equivalent in surgical technic.

If the patient be a multipara and at or near term, we can often afford to temporize, under certain conditions, whether the hemorrhage be external or concealed. If the hemorrhage be concealed, but apparently not of great extent, this to be judged by half hourly measurements of the circumference of the abdomen and the height of the fundus above the symphysis, the hourly estimations of hemoglobin, a close watch on the pulse; if the uterus shows periods of definite relaxations and contractions, thus proving that it still possesses a fair degree of muscle tone, that it is not overstretched to the point where it cannot contract, it would seem that we can afford to wait for the woman to deliver herself, or at least to dilate enough so that she can be delivered quickly if necessary. In my judgment, the greatest importance should be placed on the effort to determine the muscle tone of the uterus because upon this will depend whether the uterus will contract after delivery, or whether it will become an inert, boggy mass, leaking like a sponge, resisting all efforts to stop its oozing. Should it be reasonably decided that the tonus is destroyed, the uterus paralyzed, the patient will probably be given a better chance for her life by having the abdomen opened, when the uterus may be removed if it does not behave properly after having been emptied. Dr. J. Whitridge Williams and others (Couvelaire) have shown that the reason for the inability of the uterus to contract postpartum, is a condition of multiple hemorrhages into the muscle fibers, separating the individual fibers, causing "dissociation." This has no doubt already taken place when the uterus is apparently paralyzed by overdistension. By gentle and frequent palpation, I believe we can often determine this point and if so, it should prove helpful in the conduct of the case.

By temporizing I do not mean that we are to do nothing, that we can afford to leave the case to the observations of a nurse or interne, but I do mean that each case should be carefully studied and not rushed off at once to cesarean section. If we decide to treat the case conservatively, there are two methods that offer a degree of success; the hydrostatic bags and plugging the vagina with gauze or tampons. Should the patient be in active labor when the accident first occurs, it may be sufficient to rupture the membranes and let the head come down: the membranes being ruptured, the muscle can clamp tightly around the fetus and the bleeding considerably lessened, occasionally stopped. If the patient be in mild labor, with fair muscle tone, it may be well to try first a bag, using one not large enough to entirely dislodge the head, yet sufficiently large to fill the cervix as a plug and prevent the escape of blood. The method of plugging the vagina was originated at the Rotunda and has been used so long in that institution that it has become generally known as the "Rotunda Method." It is applicable, in my judgment, to those cases that are near term,

but not in labor and with membranes intact. If a fairly active muscle can be diagnosed, no matter whether the hemorrhage be external or concealed, we may reasonably expect a safe delivery for the mother.

The word "plugging" is well used because that is just what is meant, and upon the tightness with which this is done, will depend to a large extent the efficacy of this treatment. If there is bleeding from the upper portion of the uterus, and the membranes are intact, as soon as the pressure between the uterine walls and the membranes becomes sufficient, it will overcome the pressure in the bleeding vessels and the bleeding will cease. This degree of pressure can hardly take place if the blood has found its way down between the membranes and uterine wall, and reached an outlet in the vagina. If the vagina be tightly plugged and in addition a tight T binder be put on, (the abdominal part of the binder being broad) the hemorrhage will be controlled in a fair proportion of cases. When the plug is removed, after some hours (6 to 12) the cervix will be found easily dilatable, if not already largely dilated, and delivery can soon be accomplished, rapidly if necessary.

To tightly plug the vagina the woman should be placed in the left lateral prone posture, the vagina exposed by a Sims speculum, and allowed to balloon itself. Large separate tampons, having been boiled in weak lysol solution, are wrung as dry as possible and placed in each one of the four quadrants of the culdesac, so that the cervix is completely surrounded and compressed. (If labor has not begun and the cervix shows no obliteration, a strip of gauze may be packed into the cervical canal.) Four other tampons are then placed in the interstices of the first four and the column thus built up until the vagina is filled, literally to overflowing. These should not simply be placed in position, but should be packed there. A thick vulval pad is then put on, held in place by the T binder. The woman should then be put back to bed and enough morphine and hyoscine (or scopolamine) given to allow her a degree of ease, and probably sleep. If labor soon ensues, so much the better, if not the pack should be removed in about twelve hours; if hemorrhage recurs, and conditions be such that she cannot be delivered quickly, the pack can be replaced.

A recent personal letter from Dr. FitzGibbon, the present Master of the Rotunda Hospital, states that the method of plugging the vagina is still practiced there in the majority of cases and with a marked degree of success to both mothers and babies. He would limit section to those cases "with symptoms of bleeding with evidence of toxemia and evidence of bad tone, as shown by the globular uterus, loss of ovoid shape, suggesting distention." He does not feel inclined to give up this treatment (by plugging) and cites the following record for his reasons. From 1903 to 1910 there were 47 cases, (concealed,

external and mixed) 21 of them were plugged, 26 were treated by rupture of membranes with tight binder, or in the simple, slightly bleeding cases, by binder only. There were 23 children born alive, 6 were already macerated, showing that death had probably taken place before the women came under observation. There were only two deaths among the mothers. This is an excellent showing for so serious a condition. From 1910 to 1918 there were 45 cases, mixed types; 18 children born alive, 5 macerated. There were 8 maternal deaths in this series; 4 of these were abdominal section cases, the other four deaths were from various causes (version, postpartum nephritis, vaginal hysterotomy, etc.) In 1920 there were 7 cases, no sections, no maternal deaths, 6 living children, 1 macerated. In the 8 radical cases, that is, the cases treated by means other than plugging, (version, section, vaginal, hysterotomy, etc.), there were no living children.

I have treated four cases by conservative methods, two were plugged, two bagged. No maternal deaths, 1 macerated fetus, 3 children born alive. The first of these was a primipara, twenty-six years; bleeding set in before labor commenced and the fetus was dead when patient was first seen. After plugging no more hemorrhage occurred (this was external type) active labor pains began in four hours and she was delivered of a macerated fetus ten hours later. The placenta had been separated over some four-fifths of its surface, evidently several days before, as the "nest" in the placenta occupied by the clot was deep, the placental tissue under the clot very thin, and the clot very black. This woman was rather deeply jaundiced, but had showed no symptoms of toxemia sufficiently marked for her to mention them to me. The jaundice was probably of hematogenous origin, the evidence being that the bleeding began some days before it became visible in the vagina. She had no albuminuria. I have since delivered her of a fine healthy boy, with no untoward symptoms. The second case was a 2 para, twenty years, previous pregnancy had been normal, present pregnancy normal up until the time that severe hemorrhage took place before labor, at about term. She was plugged, (cervix was thinned, os well open) and four hours later delivered by forceps of a living child. Dilatation was not quite complete when the pack was removed, but it was easily completed, and as the hemorrhage began to recur, she was delivered at once. This woman showed no signs of toxemia, she was scrubbing clothes in a wash tub when the hemorrhage began. She has since been delivered of one normal child, normal pregnancy, and is just about at term now, condition excellent. The bleeding in her case was the most severe I have seen. Probably one-fourth of the placental surface had been separated, evidently quite recently. The third case was a primipara, twenty-three years, about at term. Had been having some unusual pain in abdomen for some weeks.

Upon examination slight, concealed hemorrhage was diagnosed. By rectal examination the cervix was found to be not obliterated, os would admit one finger. A bag was put in, which was expelled in six hours, desultory pains continued for some twelve hours more, at which time, the fetal heart having been rising slowly, dilatation was completed manually and delivery easily accomplished with forceps. Small child, not vigorous, respiration poor. Placenta showed evidence of old separation along one border, probably one-eighth of its total surface. This patient showed some albuminuria, and a systolic pressure of 150.

The fourth case was 2 para, twenty-seven years. Previous pregnancy and labor normal. Approximately seven months pregnant. Hemorrhage occurred first, labor pains ensued in about one hour. Cervix was thinned but not obliterated, os would admit two fingers (rectal examination). After observation of the patient for several hours, a Voorhees bag was placed. During this time the bleeding was not alarming. After the introduction of the bag the external bleeding became very slight, and the internal presumably did not increase, the external measurements remaining approximately the same. The bag was expelled in three hours. Pains ceased entirely for thirty minutes after the bag was expelled, then began spontaneously, very slight bleeding. Five hours later, the child still being alive and apparently in fair condition, with the cervix obliterated, os about ¾ dilated, dilatation was completed manually and child delivered by forceps. It was feeble, weighed 4½ pounds, lived eighteen hours. This mother was a typical "picture of health," and never showed any signs of toxemia. She has had several attacks of what has been diagnosed appendiceal colic, and three weeks before the accidental bleeding, she had a hard fall from a stool upon which she was standing. She had very little inconvenience from the fall, not sufficient to notify me, and it would hardly seem that the fall, three weeks before the onset of any symptoms, could have caused the hemorrhage of apparently recent origin. Trauma is supposed to produce premature separation and it seems that certain direct blows could have that effect. It seems reasonable too, to suppose that a very short cord, with a vigorous fetus, might start a separation, in the last month when the placenta is less firmly attached. However in this condition, as in many others, where a multiplicity of causes are supposed to produce the same effect, we can be chary of accepting many of them, just as when a multiplicity of remedies are offered for one disease we are slow to accept any of them.

The literature shows an increasingly greater number of cases of accidental hemorrhage being treated by section. This may be good treatment at times, and is the absolute indication in some, but we should be careful to see that a real indication is present before we

deliver the woman through her abdomen. There are many future risks that such a woman has to face, the details of which will not be discussed now; suffice it to say that we know such risks do exist, and the point is, before doing section, it is important to decide that the patient will not be subjected to greater future risks than the one from which we are endeavoring to relieve her.

There is no question but what all women who show symptoms of premature separation should be treated in a hospital, section should always be considered and provision made for such emergency. However, this accident will inevitably take place, and sometimes under circumstances where hospital services cannot be obtained, and in such cases, it should be remembered that there are methods, other than section, which offer a reasonable degree of success to the man who will remain with, and carefully observe, his patient.

AUSCULTATION OF THE FETAL HEART IN PREGNANCY AND LABOR*

By William Pfeiffer, M.D., Brooklyn, N. Y.

THE routine auscultation of the pregnant uterus in the later months of gestation and in labor offers information far more important than the mere detection of the fetal heart. While this is the principal sound heard, too often it is sought for merely as the final step in diagnosing position, ignoring the very valuable suggestions presented by the rate and rhythm of the fetal heart as changed by uterine contractions. How are these changes produced, and what is their significance? Where does the uterine souffle originate, and has it any relation to the cardiac change? What importance is to be attached to the funic souffle? A search of the literature gives scant and conflicting information on these points, and with the exception of one or two authors, these topics are almost ignored in recent text-books.

Close auscultation shows many more cases of minor degrees of fetal distress than are ordinarily believed, and these can, in almost every instance, be recognized before delivery, without the late evidence of the meconium-stained fluid which, in cephalic presentations, has long been known to be a symptom of fetal danger. Observation extending over a period of years of the change in rate and rhythm of the fetal heart has prompted the above questions resulting in this study as an attempt to answer them.

First, and probably of least importance, the funic souffle. It is now accepted as occurring solely in the cord and due to obstruction in the circulation through the umbilical arteries. Heard in not over 15 per cent of cases, it accompanies the first sound of the fetal heart and appears and disappears during a single examination. While often present in multiple coils about the neck, torsion of the funis in its long axis, etc., it has recently been found absent in a case of true knot, and it is not always present in other cases of undoubted obstruction. If found constantly in a given case and accompanying decided cardiac irregularity, it has undoubted significance, but unless the latter be present, the funic souffle usually can be disregarded with safety.

Second: The uterine souffle. Formerly believed to be due to the circulation of blood through the placenta and hence called then the placental souffle; it is found after the termination of the third stage, and wherever the uterine vessels are dilated, as in fibroids, etc. It is of very common occurrence in pregnancy and is heard oftener on the left side than the right, perhaps because of the right lateral ob-

*Admission Thesis.

liquity of the uterus. Careful observation of this sound late in pregnancy and in labor will show interesting changes in its intensity. At definite intervals corresponding to uterine contractions the bruit gradually becomes fainter until at the height of the muscular effort, it disappears entirely, often for as long as ten seconds, returning with increasing volume as the contraction passes off. By listening to the bruit, the contractions can be predicted as occurring before the patient experiences any sensation of pain whatever, and its cessation noted before relief is complete. The Decrescendo is due to the automatic ligation of the vessels coursing through the uterine walls, until at the peak no sound is audible if the contractions be vigorous; the Crescendo is due to the gradual passing of the muscular effort and consequent return of the circulation. Late in labor when the contractions are frequent and forceful, the bruit shows these changes in marked degree as would be expected and the fetal exchange of gases often seriously threatened. This will be referred to more in detail below.

Third: The fetal heart. According to Edgar, the fetal heart probably assumes its function by the third week, but its detection at a period earlier than the sixteenth week is very doubtful. It is not subject to changes in rate and rhythm before the last trimester, for it is only then that the uterine contractions become forceful enough to affect the uterine blood supply. If the fetal heart be examined during a period of uterine rest and then at the height of a contraction, there will be found a drop of ten to fifteen beats per minute in the latter state. This is quite common in the last trimester, more pronounced in the last few weeks, reaching its almost universal occurrence in labor. As the head is about to be expelled, the heart beat falls to a rate slow enough to alarm unless one has been prepared for the drop by previous experience. The slowing of the rate is proportionate to the degree and duration of the contraction and does not reach its maximum until the peak of the contraction, returning rapidly to the normal count, often reaching it before the pain has ceased. Where the rate is not slowed in labor, the contractions are often inefficient, as in inertia. Various explanations have been given for the change in rate and rhythm. That it is not due to direct pressure of the uterus upon the fetus is shown by the fact that the slower count is found equally marked whether the bag of waters is intact or ruptured. Furthermore, external ballottement, any rough handling of the abdominal wall, rapid changes of posture by the patient—all increase the fetal heart rate, averaging ten to sixteen beats per minute up to the time that these manipulations excite uterine contractions; these manipulations are akin to direct uterine pressure upon the fetus. The force of this pressure is at its maximum at the internal os, resulting, during labor, in the mechanism of the first stage. Prior to this time, pressure upon

fluid within a closed cavity is transmitted equally in all directions and, hence, is with equal force away from the fetus as upon it, thus excluding fetal pressure as a cause for slowing of the fetal heart. Schultze believed that it was due to maternal blood being forced out of the placenta during uterine contractions. This is not probable, for vigorous contractions do not appreciably diminish the placental site until after the second stage, nor is the placenta itself subject to severe compression, hence the total volume of blood in this area must change very little.

From physiology we learn that CO_2 slows the heart. The method of its action, whether through vagus stimulation, or otherwise, does not concern us in this study. We learn also that variations in the heart beat are in accordance with the gaseous condition of the blood. It is interesting to note, in passing, that what is known as potassium inhibition may aid the action of CO_2. Potassium is liberated by vagus stimulation, and as potassium in certain concentrations brings the heart to a standstill, it very closely resembles the state of vagus inhibition.

A study of the fetal circulation shows that the fetus receives very little pure arterial blood and while the elimination of CO_2 and absorption of oxygen are usually at a balance, there is still a very marked retention of CO_2 at all times, this becoming greater as its active metabolism increases progressively to term. Thus we have a fetus supercharged with CO_2 and one whose heart is just about balanced by the exchange of CO_2 and O. Entering labor in this state, the vigorous uterine contractions diminish or cut off the blood to the uterus, as shown by the disappearance of the uterine souffle, and we have not only a deprivation of O, but, what is more important, a marked retention of CO_2. Thus the heart is slowed. When the contractions are feeble and short, this can hardly be noted, but toward the end of labor, or in a spastic uterus it is decided, and, as before stated, alarms one not previously prepared for its occurrence. If the drop of the beat be not over ten to fifteen beats per minute, there is little to fear, particularly if the return to normal be prompt and the rhythm be maintained; but where the excursion is wide from 120 to 80, for instance, as in a case recently observed, with an irregular rhythm and a slow return to the count found in the relaxed uterus, the child is in danger unless delivery is about to occur. The use of oxytocics, in the light of this study, is seriously to be questioned, and the routine and frequently-repeated examination of the fetal heart during labor is seen to be of great prognostic value. Polak pointed this out as one of the lessons learned at the time of the popularity of twilight sleep, particularly the importance of the wide variation in the beat with slow return to normal.

CO_2 is not only a cardiac depressant, but has been called by Starling the normal respiratory hormone. While O may also stimulate the center, the reaction is nothing like so sensitive as that due to CO_2. From what has been said above, then, we find the fetus in a state of apnea; dyspnea or partial asphyxia occurs on slight pretext from the normal blood-supply supercharged with CO_2 and its increasing percentage of this gas toward term, arising both from its metabolism and its periodic deprivation of O during vigorous uterine contractions. In asphyxia arterial pressure rises through the intermediation of the splanchnic nerves and is, therefore, associated with the discharge of adrenalin. It is on this account that in the organism, provided sufficient O be supplied, very large percentages of CO_2 can be tolerated without causing dilation of the fetal heart. The effect of the adrenalin serves to counteract the injurious influence of CO_2 on the heart muscle. The child breathes at birth from the stimulation of the respiratory center by CO_2 and not because of its changed environment, nor because of the effect upon the respiratory center through the skin of a sudden difference in temperature; once the respiration is established, the latter may aid its maintenance. Crying in utero is not unknown; the sucking of the examining finger in face presentations not infrequent; the attempts at respiration during version and forceps extraction are often noticed, and yet all of these are relatively infrequent compared with the total number of deliveries in normal cases in which the heart is slowed, and the child breathes and cries promptly on delivery of the head. Only by the action of CO_2 on the cardiac and respiratory centers can this be explained.

It has long been felt that the child born moderately cyanosed was a safe child and respiration followed promptly. Carry this a step further and we have a child asphyxiated to a degree that the livid stage is reached with meconium-stained amniotic fluid—long regarded as of serious import in cephalic presentations. This is now known to be due not at all to pressure on the fetus, for it is seen with intact membranes, nor so much to stimulation of peristalsis by CO_2, but to the relaxation of the sphincter ani common in asphyxia. The vomiting of mucus and occasionally altered blood after delivery is evidence of fluid swallowed during premature respirations. The deaths from cerebral hemorrhage in spontaneous deliveries, and those in otherwise apparently normal cases, as well as those formerly classified as due to unexplained dystocia, can, in some instances, be regarded as due to asphyxia. Were it not that the fetal respiratory center possesses a lower degree of irritation than that of the mother, very many more cases of asphyxia would occur, though the whole number of these is greater than usually believed. The heart beat over 160 is that of

asphyxia and is of as serious portent as the slow and irregular beat which often precedes the rapid rate.

To demonstrate the changes in the uterine souffle and fetal heart, select a multigravida early in labor, or late enough in pregnancy to have uterine contractions of sufficient force to obliterate the souffle. The primigravida is usually not as good a subject for demonstration, as the uterine contractions, plus those of the abdominal muscles, are often vigorous enough to make auscultation difficult. Where possible, a patient in whom the fetal heart is louder on the side where the souffle is of greater intensity, is the better subject, as the changes can be heard without the loss of time in moving the stethoscope. The pressure of the hand on the fundus intensifies the change by increasing the force of the contraction.

It is felt, then, that the slowing of the fetal heart and the early stimulus to respiration are due to the same cause—retention of CO_2; that this retention is due to automatic ligation of the intrinsic uterine blood-supply proportionate to the degree and duration of the muscular contraction of the uterus; that the very frequent occurrence of the uterine souffle with its disappearance during uterine contractions, is an evidence of the cutting off of the blood supply; and that the funic souffle, unless accompanied by evidence of cardiac distress or premature respiration, is of no especial value.

The very practical value of the entire subject removes it from the realm of the theoretical and emphasizes the value of obstetrics as a specialty in which every delivery is a matter of not only particular study, but of minute and repeated examination throughout the entire course of labor.

BIBLIOGRAPHY

Starling: Text Book of Physiology. *Howell:* Text Book of Physiology. *DeLee:* Text Book of Obstetrics. *Edgar:* Text Book of Obstetrics.

THE TREATMENT OF CANCER OF THE UTERUS*

By Henry Schmitz, M.D., F.A.C.S., Chicago, Ill.

THE objects of this study are to discuss the prophylaxis of uterine cancer, to briefly review the diagnosis of carcinoma of the uterus, to correctly group the various stages of the disease, and to base the indications for a correct treatment on such grouping. Thus we may form a common working ground to enable us to define the indications and limitations of the surgical treatment as well as of the radiation therapy. The various methods of the radiation therapy and their proper application will be briefly considered. The apparent value of the x-ray and gamma-ray in the treatment of cancer of the uterus will be presented in the statistics of 168 consecutive cases treated and followed up from April 1, 1914, to December 31, 1919.

The physician is frequently consulted by patients complaining either of a leucorrhea that has existed for many years, or persistent menorrhagias and metrorrhagias, or sterility, though they had given birth to an offspring within the average normal period of time after entering married life. A small number of these patients may not present any visible or palpable pathology, but suffer from constitutional diseases and disturbances of the endocrinal glandular system. The larger number, however, evince pathology, chiefly of either the cervix, the body of the uterus, or the vaginal outlet, as diastasis of the levator ani muscles with prolapse of the vagina and uterus, chronic inflammations of the endocervix and endometrium, and chronic myometritis. The pathological states causing the enumerated symptoms are, almost invariably, characterized by hypertrophic processes—the result of proliferation of elementary tissue layers. Hence, treatment is rendered imperative. This may consist in a very thorough curettage of the endometrium and endocervix, an amputation or conical excision of the cervix, a levator ani muscle suture to close the vaginal introitus, and thus prevent irritating substances from entering the canal. The removed tissues must be microscopically examined by a competent pathologist. As a matter of fact the purpose of these surgical procedures is to obtain material to demonstrate absence or presence of malignancy. Should evidences of malignancy exist then the classical panhysterectomy, either abdominal or vaginal, preferably with the use of the actual cautery, must follow the primarily diagnostic, but also the supposedly curative, operative procedure. Quite a number of such patients may not show any evidences of malignancy on the microscopic study of the removed tissue; yet, after a brief period of

*Admission Thesis.

an apparent recovery, the same symptoms and signs return. Such a state of affairs we should designate as clinically malignant and apply to it the treatment advised for carcinoma.

Every gynecologist will recall *to his mind* a greater or lesser number of such instances. In the writer's experience almost all the patients that survived an operation for carcinoma for the customary five year limit, had been subjected to a panhysterectomy either on account of unexpected microscopic findings, or the recurrence and persistence of the underlying pathologic process after minor surgical procedures instituted for the correction of apparently benign diseases. Hence, the treatment of cancer of the uterus comprises also prophylaxis.

The cancer patient coming to the physician for consultation usually suffers from the well-known symptom triad: discharge, hemorrhage, and pain. The discharge is the earliest, the hemorrhage the most alarming, and the pain the most unfavorable symptom of cancer of the uterus. The occurrence of hemorrhage signifies an advanced stage of the disease. The patient is willing to endure pain of marked severity, or to tolerate a discharge of very bad odor, but the occurrence and persistence of hemorrhage will finally force her to seek medical advice.

The examination of a patient, the victim of uterine cancer, should have for its purpose an exact answer to the following questions:

1. Is the cancer clearly localized within the uterus?
2. Has it invaded the contiguous tissues and organs?
3. Has it involved the regional lymphnodes?
4. Has it formed metastases in distant organs and structures, as the liver, the bones, and so forth?
5. Do constitutional maladies as Bright's disease, diabetes mellitus, decompensated heart lesions, etc., complicate the uterine disease?

The methods to be applied are bimanual vagino-abdominal and recto-abdominal examinations, endoscopic examinations of the rectum and bladder, careful, general, physical, and laboratory investigations. The results obtained will enable us to answer correctly the above five questions.

A clearly localized carcinoma indicates a surgical eradication. A panhysterectomy will enable the surgeon to remove, absolutely, all cancer cells. After having opened the abdomen we must at once proceed to make a careful palpation and inspection of the pelvic organs. Should the regional lymphnodes be enlarged, or the parametrial tissues be indurated, then the operation must be terminated as it is unlikely that all the cancer elements can be removed by even a very careful and extended operation. Hence, operability depends on one fact: absolute localization of the malignancy within the limits of the

uterus. The deplorably poor results shown in the statistics of the surgical treatment of uterine cancers are solely due to the nonobservance of this one factor and tend to discredit surgery. As a consequence a great number of patients refuse to submit to surgical treatment, even if indicated, because they know of the great number of failures following operative procedure.

Enlargement of the regional lymphnodes or induration of the parametria may be the result of a secondary complicating infection. Since the greater number of carcinomata, thus complicated, are of an advanced stage in which broken down and necrotic tissue form the port of entry for pathologic bacteria, it is evident that we must ascribe such findings, in the beginning of cancer cases, to cancer invasion.

Borderline cases and those with a demonstrable beginning invasion of contiguous tissues and organs and regional lymphnodes, or clearly localized cases, occurring in patients with constitutional contraindications to operation, form the ideal group for radiation therapy. It is in these cases that x-ray and radium radiations caused the greatest number of local healings and apparent cures.

The advanced, desolate case, either with a "frozen pelvis," or extensive general constitutional weakness, contraindicate radiation treatment. Such patients should be treated symptomatically. Should radiation be used they may succumb to radiation toxemia as they are so weakened by the cancer that they cannot anymore activate the defensive forces necessary to carry them safely over the period of reaction. Again the rays may rapidly destroy the necrotic processes and urinary and fecal fistulæ may promptly appear adding to the already unbearably misery of the sufferings from such fistulæ.

Summarizing these facts, we may group the cases and formulate the indications for treatment as follows:

Group I. Cases which are *clearly localized* after a physical examination—*the operable cases*—are treated with an abdominal panhysterectomy.

Group II. Cases which appear to be *doubtfully localized* after a physical examination—*the borderline cases*—and operable cases rendered a poor surgical risk due to complicating constitutional diseases, form the ideal group for radiation therapy.

Group III. Cases in which a *demonstrable invasion* of the contiguous and distant tissues and organs and regional lymphnodes is found on physical examination—*the clearly inoperable cases*—are subjected to an intensive radiation treatment.

Group IV. Cases so *far advanced* that all treatment seems hopeless —*the terminal desolate cases*—are treated symptomatically.

Group V. *Recurrent cases, local and regional,* are treated according to the same grouping and indications as stated under Groups I to IV.

Various controversies have arisen, from time to time, concerning the advisability of combining surgical with radiological procedures. Discussions have also been held on the choice of radiation. Some claim that radium rays are more effectual in killing off the disease than x-rays; while others assert that a combination of both radium and roentgen rays assures better results.

The object of the curative treatment of cancer of the uterus is the eradication or degeneration of all cancer cells without permanent injury of the neighboring healthy organs as the bladder, the rectum, the small bowels, and so forth. The uterus is contained within the true bony pelvis. The possible extent of the cancer Groups I, II, and III may be assumed to be confined to this space. The axis of the uterus corresponds in most cases to the axis of the true bony pelvis. The posterior bladder mucosa and the anterior rectal mucosa are two to three centimeters distant from the cervical canal. If radium be inserted into the cervical canal, the time duration of the application depends entirely on the intensity of radiation striking the bladder or rectal mucosa. For instance 50 mg. of radium element filtered through 1.5 mm. of brass and 3 mm. of pararubber inserted into the cervical canal will cause an erythema of the vesical mucosa and of the rectal mucosa within thirty hours. Since the lethal amount of radiation that the rectal mucosa will bear without any permanent injury is 130, if 100 means the intensity of the dose sufficient to produce an erythema skin dose, we cannot extend the application of 50 mg. radium element beyond thirty consecutive hours, if we wish to avoid ulcers and strictures of the rectum. It is, therefore, seen that the extent of the action of radium rays must be limited if we wish to avoid irreparable injury to neighboring vital pelvic organs. However, in doing this the cancer elements, lying near the bony pelvic periphery, are not only not degenerated but stimulated to increased activity and proliferation by the so-called "stimulating dose" of the rays.

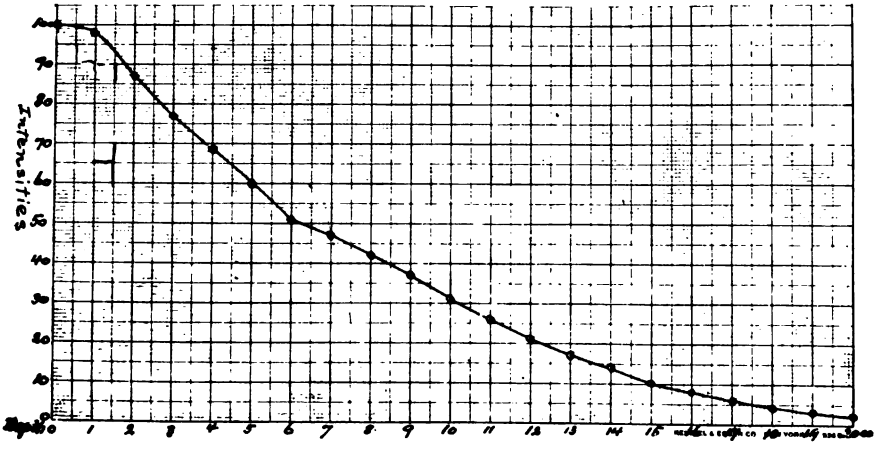
Institutions possessing large amounts of radium have recognized this fact and attempted to treat the peripheral regions through the suprapubic abdominal wall using packs containing upwards to one gram of radium element. Recently it was reported that this plan has been abandoned because of its being economically inadvisable. If the radiation therapy is ever going to be available to all the sufferers from uterine cancer, a technic must be evolved which can be used in every hamlet of our country.

We have been working on this problem for many years past and are convinced that by a combination of radium and roentgen radiation

we will solve it. Through the generosity of the General Electric Company we have been supplied with an instrument which enables us to measure the intensity of radiation emitted from a Coolidge x-ray tube. We found that with this instrument we can measure a quality of x-radiation which, when applied through only two ports of entry under like conditions, sends an intensity of about 75 per cent of the surface skin intensity to the region of the cervix if the anteroposterior diameter of the pelvis is not more than 16 cm. See Table I. Therefore, it is only necessary to supply the missing 25 per cent with the

TABLE I

MEASUREMENTS OBTAINED WITH A FÜRSTENAU INTENSIMETER; TRANSFORMER, VICTOR SNOOK; TUBE, COOLIDGE; 5 MA.; FOCAL DISTANCE, 35CM.; FILTERS, 10 MM. ALUMINUM + 6 MM. SOLE LEATHER; K. V., 140 PEAK DETERMINED WITH A SPHERE GAP; PORTAL OF ENTRY, 20 CM X 20 CM.



use of radium radiation in order to obtain an intensity of 100 per cent all through the pelvis. It is conceded that 100 represents the intensity of radiation necessary to produce an erythema skin dose, and it is further conceded that this intensity amply suffices to degenerate cancer cells. Fifty milligrams of radium element will accomplish this very nicely with thirty hours' application. Patients having an anteroposterior diameter of more than 16 cm., from the anterior skin surface to the posterior skin surface require a longer continuous application, though we may cause severe injuries to bladder and rectum with the larger doses. See Tables II and III.

The technic of radiation treatment, therefore, consists in the combined use of the roentgen and radium radiation. A solution of the problem is shown in Fig. 1. It shows the intensity of measured rays at each point within the pelvis for x-rays, also the isodoses of gamma-rays measured with a 50 mg. radium element capsule within water, thus indicating the total primary and secondary radiations. The

measured x-ray intensities also represent a summation of primary and secondary radiations. Table II indicates how unfavorably the summation of radiation becomes with an increase in the anteroposterior diameter above 18 cm. The greater diameters are found in obese and large-boned women. To increase the radiation dose in such patients we have of late applied the x-rays through three portals of entry. The advantages thus gained are an increased x-ray intensity in the cancer area as demonstrated in Fig. 2.

Should radiation treatment be combined with surgical procedures to increase the efficacy of either one? It has been proposed to precede

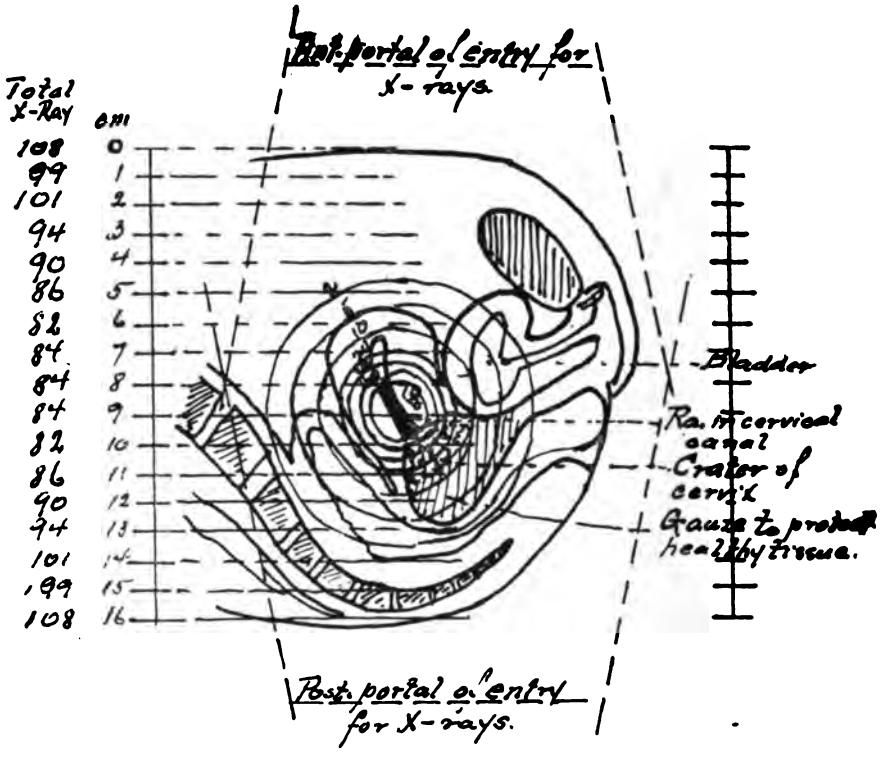


Fig. 1.—Median longitudinal section of pelvis showing isodoses of radium capsule, column to left gives total x-ray intensities obtained for each centimeter of depth. Modified from Opitz-Friedrich.

panhysterectomies for cancer of the uterus with radiation therapy, obviously to degenerate the cancer first and thereby render safer the surgical procedure. To apply radiation properly it is necessary to employ such an intensity of radiation that the periphery of the bony pelvis is struck with the same intensity as the region in the axis of the pelvis, i.e., the cervix; otherwise the peripheral cancer cells are stimulated to increased proliferation. Such a radiation treatment always causes a decided radiation sickness. During this period the patient could not be safely subjected to the additional trauma and

X-Ray Dose Breech Cm. Surface	100
1	98
2	87
3	77
4	69
5	60
6	51
7	47
8	42
9	37
10	31
11	26
12	21
13	17
14	14
15	10
16	8
17	6
18	4
19	3
20	2
21	1
22	0

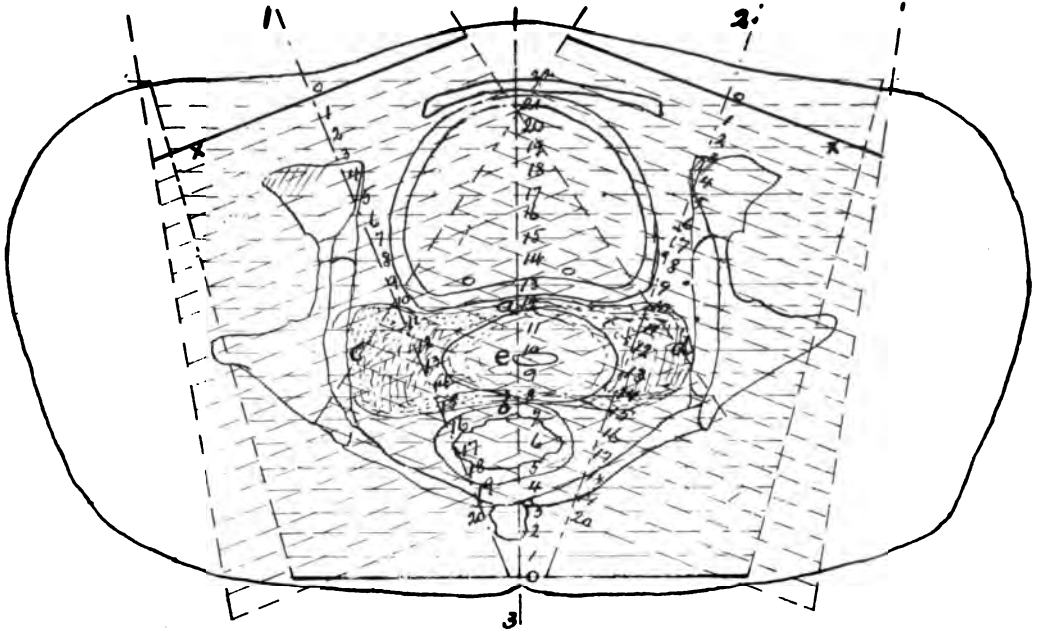


Fig. 2.—Patient with an anteroposterior diameter of 25 cm., reduced by compression to 22 cm. Transverse diameter 44.5 cm. Anterior superior spinous processes, marked x, 28.5 cm. Radiation beams 1 and 2 should be applied at an angle of about 55° so axis is centered upon cervix.

Dose at a: 21+21+21=63
Dose at b: 42+ 8+ 8=58
Dose at c: 31+26+ 8=65
Dose at d: 31+ 8+26=65
Dose at e: 31+14+14=59

Dose at 18: 4+41*+41*= 86
Dose at 19: 3+48*+48*= 96
Dose at 20: 2+55*+55*=112
Dose at 21: 1+55*+55*=111

Dose if only one anterior median and one posterior median field used.

At a: 21+31=52
At b: 42+14=56
At c: 31+21=52
At d: 31+21=52
At e: 31+21=52

*Peripheral intensities are 20% less than those within a radius of 6 cm. Technic: Coolidge tube; 140 peak K. V.; 5 ma.; 35 cm. focal distance; 10 mm. aluminum + 6 mm. sole leather filters.

shock of a capital surgical procedure. The operation must be postponed for from three to six weeks during which time the patient will have recovered from the radiation toxemia. If the operation is performed within a few days after radiation, the patient succumbs to sepsis and shock with an alarming frequency. Should the operation be postponed to a later period, the same danger is still present on account of necrosis of tissue in the cervical canal which cannot be avoided. These factors and the intense connective tissue formation in the parametrium which renders hemostasis difficult do not make it advisable to resort to preoperative radiations.

Should a panhysterectomy for a clearly operable uterine carcinoma be followed by radiation to prevent recurrences? Recurrences result from carcinoma cells left behind during an operation. They are found either in the tissues surrounding the wound crater or at the periphery of the bony pelvis. The former are termed local and the latter regional recurrences. The very element rendering radium treatment of the cervical region possible without causing irreparable damage to the bladder and rectum, i.e., the uterus, has been removed by the operation. Radium rays could now be made effective only in the superficial tissues of the wound cavity and the vaginal fornix. Additional roentgen ray radiation applied also will not enable us, in conjunction with radium radiation, to attain the uniform intensity all through the pelvis necessary for our purpose. Hence, we are more and more inclined to the opinion that the cancer must be clearly confined to the limits of the uterus, if the operation is justifiable. Under these conditions postoperative radiations are useless. If, however, an operation has been performed, and during its progress it is found that the cancer invaded adjacent structures, or the probabilities are that cancer tissue has been left behind, then a combined radiation treatment must be given. It must be as intensive as if the panhysterectomy had never been performed, regardless of the consequences to the patient. If we wish to be successful we must treat the disease and not the patient.

It has been advocated to render inoperable carcinomata operable by radiation, as the latter causes an apparent resorption of the cancer tissue. The uterus and adnexa will appear freely movable and of normal size, shape, form, and consistency. A panhysterectomy could be easily performed, though necrosis might still be present in the cervical canal and hemostasis be difficult of execution. Again it has been proposed to excochleate and cauterize the tumor bed. Radiation would then become more effective. However, our experience leads us to state that preradiation curettage and cauterization, or postradiation panhysterectomy in the clearly inoperable cases, render the patient's chances for even a temporary improvement decidedly worse. As a

TABLE II

X-RAY INTENSITIES OBTAINED FOR EACH CM. BY THE USE OF TWO PORTALS OF ENTRY—SUPRAPUBIC AND SACRAL—SIZE OF FIELD 20 CM. DIAMETER; FOCAL DISTANCE 32-35 CM.; MA. 5; MAX. K. V. 126; FILTER 10 MM. AL. + 6 MM. SOLE LEATHER; FOR ANTERO-POSTERIOR DIAMETERS OF 16, 18, 20 AND 22 CM.

I				II				III				IV			
	Intensities				Intensities				Intensities				Intensities		
Distance, Cm.	Anterior Field	Posterior Field	Total	Distance, Cm.	Anterior Field	Posterior Field	Total	Distance, Cm.	Anterior Field	Posterior Field	Total	Distance, Cm.	Anterior Field	Posterior Field	Total
Surface	100	8	108	Surface	100	4	104	Surface	100	2	102	Surface	100	0	100
1	98	10	108	1	98	6	104	1	98	3	**101**	1	98	1	**99**
2	87	14	101	2	87	8	95	2	87	4	**91**	2	87	2	**89**
3	77	17	94	3	77	10	**87**	3	77	6	**83**	3	77	3	**80**
4	69	21	**90**	4	69	14	**83**	4	69	8	**77**	4	69	4	**73**
5	60	26	**86**	5	60	17	**77**	5	60	10	**70**	5	60	6	**66**
6	51	31	**82**	6	51	21	**72**	6	51	14	**65**	6	51	8	**59**
7	47	37	**84**	7	47	26	**73**	7	47	17	**64**	7	47	10	**57**
8	42	42	**84**	8	42	31	**73**	8	42	21	**63**	8	42	14	**56**
9	37	47	**84**	9	37	37	**74**	9	37	26	**63**	9	37	17	**54**
10	31	51†	**82**	10	31	42	**73**	10	31	31	**62**	10	31	21	**52**
11	26	60	**86**	11	26†	47	**73**	11	26	37	**63**	11	26	26	**52**
12	21	69	**90**	12	21	51	**72**	12	21†	42	**63**	12	21	31	**52**
13	17	77	94	13	17	60	**77**	13	17	47	**64**	13	17†	37	**54**
14	14	87	101	14	14	69	**83**	14	14	51	**65**	14	14	42	**56**
15	10	98	108	15	10	77	**87**	15	10	60	**70**	15	10	47	**57**
16	8	100	108	16	8	87	95	16	8	69	**77**	16	8	51	**59**
				17	6	98	104	17	6	77	**83**	17	6	60	**66**
				18	4	100	104	18	4	87	**91**	18	4	69	**73**
								19	3	98	**102**	19	3	77	**80**
								20	2	100	102	20	2	87	**89**
												21	1	98	**99**
												22	0	100	100

Intensities in bold face figures require additional radiation supplied by a 50 mg. Ra El. capsule as follows: To I add 20 hrs; to II add 30 hrs; to III add 40 hrs. and to IV add 50 hrs.

†Indicates the usual location of cervix.

matter of fact, the rule is that patients of the borderline and inoperable group, treated with a combination of radiation and surgery, quickly succumb either to sepsis or to a recurrence in spite of the most carefully executed radiation treatment.

An active immunization is produced by the action of radium on malignant cells. If radium or x-rays would simply kill the cells, then they would not be superior to the knife or any cauterizing agent. But the cancer cells, under the influence of rays, are stimulated to produce a specific antibody for other similar cancer cells in the tissues of the patient. Morson, Wedd and Russ, Blumenthal and Behne, have proved this contention in experiments carried on in animals as well as in men. Hence, if living malignant cells are necessary for the

TABLE III

INTENSITIES OF GAMMA RADIATIONS OF 50 MG. RA. EL. CAPSULE. LENGTH 3 CM.; FILTERS 1.5 MM. BRASS, 5 MM. CELLULOID.

SURFACE X-RAY DOSE OF 100 EQUALS E. S. D. EQUALS 425 MG. RA. EL. HRS. (FRIEDRICH)

Distance in Cm.	% of Isodoses	X-ray Dose	Values in Mg. Ra. El. Hrs. Values	Round Numbers
1.5	40	100	425.	400
2.3	20		212.5	200
3.4	10		106.3	100
4.7	5		53.2	50
5.6	2		21.3	21

VALUES OF GAMMA RADIATION EXPRESSED IN VALUES OF X-RAY DOSE FOR VARIOUS DISTANCES AND TIME DURATIONS OF APPLICATIONS

Distance Cm.	10 Hrs.	20 Hrs.	30 Hrs.	40 Hrs.	50 Hrs.	60 Hrs.	70 Hrs.	80 Hrs.
1.5	125	250	375	500	625	750	875	1000
2.3	62.5	125	187.5	250	312.5	375	437.5	500
3.4	31.3	62.5	93.8	125	156.5	187.5	218.8	250
4.7	15.7	31.3	47.0	62.5	78.5	94.0	109.7	125
5.6	6.3	12.5	18.9	25.	31.5	37.8	43.8	50

production of an autogenous vaccine or antibody, a preradiation removal of cancer cells would not be advisable. The raytherapeutist also must prevent a too extensive destruction of normal and malignant tissues, and an insufficient modification or degeneration of malignant cells. If the treatment is too radical, antibodies, necessary for the complete removal of all cancer cells, are not produced. If too small, the action may arrest the growth for the time, but recurrences must be expected.

From April, 1914, to December 31, 1919, 168 cases of cancer of the uterus were treated with radiation. Some were preceded by surgical procedures such as hysterectomy or cauterization, and in others radiation was followed by hysterectomy. However, since 1918 radiations were used exclusively. We also must state that the technic of application of rays underwent a continuous evolution until the last two

TABLE IV

END RESULTS OF UTERINE CANCERS TREATED WITH RADIUM

Year	OPERABLE			BORDERLINE			INOPERABLE			TERMINAL			RECURRENT		
	Total No.	Living	Died or No Report	Total No.	Living	Died or No Report	Total No.	Living	Died or No Report	Total No.	Living	Died or No Report	Total No.	Living	Died or No Report
1914	2	1	1	2	1	1	12		12	1		1	4		4
1915				2	1	1	9		9	6		6	9		9
1916	1	1		1		1	8		8	6		6	7		7
1917				1	1		8	4	4	4		4	3		3
1918	2	1	1	3	2	1	9	6	3	8	1	7	8		8
1919	2	2		2	1	1	22	9	13	11	1	10	15	1	14
Total	7	5	2	11	6	5	68	19	49	36	1	35	46	1	45

PERCENTAGES OF APPARENT CURES FOR 2, 3 AND 5 YEAR PERIODS

1914 to 1919 incl.	Operable ....7 Living .....5 = 71.4%	Borderline ..11 Living ..... 6 = 54.5%	Inoperable..68 Living .....19 = 27.9%	Terminal ....36 Living ..... 1 = 2.5%	Recurrent ...46 Living ..... 1 = 2.2%
1914 to 1918 incl.	Operable ....5 Living .....3 = 60.0%	Borderline .. 9 Living ..... 5 = 55.6%	Inoperable ..46 Living .....10 = 21.7%	Terminal ....25 Living ..... 0 = 0.0%	Recurrent....31 Living ..... 0 = 0.0%
1914 to 1916 incl.	Operable ....3 Living .....2 = 66.0%	Borderline .. 5 Living ..... 2 = 40.0%	Inoperable ..29 Living ..... 0 = 0.0%	Terminal ....13 Living ..... 0 = 0.0%	Recurrent ...20 Living ..... 0 = 0.0%

years when a technic had been evolved which has been described in this paper. We feel that with the development of larger Coolidge tubes, which will stand higher voltages, and of transformers, which will furnish voltages up to 200,000, we will overcome the difficulties that exist in patients having a greater anteroposterior diameter than 18 cm.

Table IV shows the number treated each year, also the number surviving today, and the number of those that have died or did not report. From the table it is seen that in Group I, of a total of seven patients treated, five are living and well, i.e., 71.4 per cent. In Group II, of eleven patients, six are alive and well, i.e., 54.5 per cent. In Group III, of sixty-eight patients, nineteen are alive and well, i.e., 27.9 per cent. In Group IV, of thirty-six patients, one is alive, i.e., 2.5 per cent. In Group V, of forty-six patients, one is alive, i.e., 2.2 per cent.

Surgery alone probably would have produced the same good results shown in Group I. We must, however, credit ray therapy for all permanent and even temporary benefits in other groups. That implies that of 161 cases in these groups twenty-seven are well today that otherwise would probably have succumbed to the disease.

The conclusions drawn from this study are: 1. Prophylaxis plays an important factor in the treatment of cancer. 2. Classification of uterine carcinomata is of paramount importance to separate localized from the more advanced cases. 3. Localized carcinomata must be treated by surgical methods, preferably with the actual cautery, while the borderline and advanced cases should be referred to ray therapy. 4. A combination of surgery with radiotherapy is not advisable. However, a combination treatment of gamma and x-rays assures better results than the application of either agent alone. The radium must be inserted into the cervical canal, while the x-rays are applied through the suprapubic and sacral regions. It also renders the treatment available for all classes of patients due to the lessened expense. 5. It is hoped that with an improvement in the technic permanent recoveries will become more numerous.

Dr. Howard W. Longyear.

In Memoriam

DR. HOWARD W. LONGYEAR

By Dr. James E. Davis, Detroit, Mich.

TO HAVE spent forty-six years in ardent successful professional life after careful painstaking educational preparation under the best of opportunities at home and abroad; to have maintained the standards and contributed to their upbuilding in word, act, and inspiration; to have been a gentleman, a higher type of citizen and a toiler after truth is attainment, success, and satisfaction.

Dr. Howard William Longyear possessed a logical mind and technical skill. His work was carefully planned and executed. He was conspicuously able to do his own thinking and carry his point to a successful issue by carefully debating the facts with logic, experience, and illustration in support of a conclusion.

As the seventeenth president of this society in 1904, the older of our Fellows will remember a leader, dignified, scholarly, and lovable—a consummation worthy of life-long endeavor.

In Memoriam

DR. THEODORE A. McGRAW

By Dr. James E. Davis, Detroit, Mich.

ENDOWMENT is a resource bestowed, acquired, and cultured. To have acquired wealth, selected environment, education, refinement, and leadership, and to have enjoyed these blessings for many years are marks of a favored son.

"Wherefore, let a man be of good cheer about his soul, * * * Who has followed after the pleasures of knowledge in this life; who has adorned the soul in her own proper jewels which are temperance, and justice, and courage, and nobility, and truth,—in these arrayed she is ready to go on her journey—when her time comes."

The above words of the great philosopher, Socrates, uttered nearly twenty-five hundred years ago seem appropriate today as we think of Dr. Theodore A. McGraw—gentleman, scholar, scientist, physician, and educator.

He was one who followed after the pleasures of knowledge in this life. He, as a physician, surgeon, and teacher, lived and practiced through that great formative period in medicine, the latter half of the nineteenth century, during which time there were more revolutionizing changes in the theory and practice of medicine and surgery than during any other half century of the world's history.

Dr. McGraw was a leader, ever growing, ever progressing, and ever giving to his students the best that was in him. His ever widening circle of influence had reached far beyond his local environment. His eminent worth was recognized and appreciated by the national societies of his profession. Yet it was among his intimate friends and associates where those proper jewels of the soul shone the brightest.

Dr. Theodore A. McGraw.

In Memoriam

DR. LEWIS CRENSHAW BOSHER

By Dr. Greer Baughman, Richmond, Virginia

Death is a road our dearest friends have gone:
Why with such leaders, fear to say, "Lead on?"
Its gate repels lest it too soon be tried,
But turns in balm on the immortal side.
—*Leigh Hunt.*

CERTAINLY it could be said of Lewis Crenshaw Bosher that he was one of my dearest friends. I have known him and admired him since I was a little boy. I esteem it a privilege to be allowed to memorialize him in the midst of his many friends, particularly as most of you could speak more eloquently, but for him none could have a deeper affection than I.

Dr. Bosher was born in Richmond, Virginia, Feb. 17, 1860, in the midst of rumors of wars, and died Sept. 12, 1920, at his residence, 422 E. Franklin Street, Richmond, Virginia, while the world was recovering from the most terrible war in all history. He was the son of Robert H. Bosher and Elizabeth Eubank Bosher. His father was a very prosperous merchant in Richmond, bequeathing to his children both his business ability and his public spirit.

In spite of the fact that young Lewis was born at the outbreak of the war and spent his childhood amidst the troublesome times of reconstruction, he received a good education first at Beeche's Academy, afterwards at Bartlett T. Davis' school, both in Richmond, Va. After finishing school he attended Richmond College, graduating with the degree of A.B. He next matriculated at the Medical College of Virginia, receiving the degree of M.D. in 1883.

The hospital appointment most sought after at that time was ambulance surgeon at the City Hospital, because it carried with it the opportunity of seeing a large amount of accident work. He obtained this appointment and served a year. In order to enlarge his surgical experience he went to New York, serving in Mt. Sinai and Bellevue hospitals.

Upon returning to Richmond he associated himself with Dr. Frank Cunningham who was one of the most distinguished physicians and surgeons of the city. He continued to work with Dr. Cunningham

until the death of Cunningham, inheriting from him the practice which he had aided so much in building.

Dr. Bosher became connected with the Medical College of Virginia upon his return to Richmond and continued to be an active teacher in that institution until his health became impaired, when he was regretfully put upon the emeritus list.

His first professorship, to which he was elected in 1888, was that of Anatomy. He was a great teacher, because he was well informed and had the ability of inspiring in his pupils the desire and necessity of studying. The boys called him "Old Bosh" because they loved and respected him. Fair warning was given when he intended to quiz. On that day every man in the class was prepared. If they failed to answer correctly it was because they tried too hard. He gave perfect demonstrations and instructions in Anatomy and demanded perfect answers in return. He got more work out of his pupils than any teacher I have ever seen.

During the period of teaching Anatomy, while doing a large general practice and the largest office practice in the city, he was operating a great deal, particularly upon genitourinary cases.

The chair of Principles of Surgery was created in 1896 and he was elected Professor.

In 1897 he was advanced to Professor of Surgery. When the Medical College of Virginia and the University College of Medicine were amalgamated in 1913 he was elected to the chair of Genitourinary Surgery.

While Dr. Bosher was a good all around surgeon it was in the domain of genitourinary surgery that he excelled.

He taught at the Medical College of Virginia during his entire medical life except for the last few years, when his health began to fail and then much to the regret of the students he was compelled to give it up.

Dr. Bosher was a many-sided man in the realm of medicine. His students recall him as the teacher who made them work harder and gave them more in return than any other teacher; the medical profession of the city and the neighboring states held his medical judgment and his skill as an operator as his most prominent and useful attributes, but those that knew him best, while acknowledging his teaching ability, recognizing his diagnostic acumen and his skill as an operator, know that as a developer of the hospital facilities of Richmond he rendered his greatest service.

His first activity in hospital development was rendered as chairman of the Board of the Old Dominion Hospital, next as President of the Memorial Hospital Association. For years as the chief surgeon of the Memorial Hospital he had complete charge of that institution.

Dr. Lewis C. Bosher.

Appreciating that the hospitalization of Richmond was not sufficient, he, in conjunction with six of his colleagues, built and equipped the Stuart Circle Hospital, a private hospital owned and controlled by these seven men. He was President of the Stuart Circle Hospital Corporation from its beginning until his death.

That Dr. Bosher was a surgeon of ability and renown is witnessed, not only by his reputation locally and over the country, but by the fact that he was made a member of many honor medical and surgical associations. He was a member of the American College of Surgeons, American Surgical Association, American Association of Obstetricians, Gynecologists and Abdominal Surgeons, Southern Surgical Association, American Urological Association, Tri-State Medical Association of Virginia and the Carolinas, Medical Society of Virginia, American Medical Association, Richmond Academy of Medicine and Surgery, Richmond Surgical Club.

He was President of the Southern Surgical Association in 1905 and President of the Richmond Academy of Medicine in 1902.

His library was full of well selected medical books and they were well thumbed. While his contributions to medical literature were not numerous, they were carefully written and authoritative. Among the articles that he contributed for the advancement of medicine and surgery might be mentioned:

Sarcoma of the Testicle, Virginia Medical Semimonthly, Jan. 24, 1902.

Dermoid Cysts and Fistulae of the Sacro-Iliac Region, Old Dominion Journal of Medicine and Surgery, January, 1905.

Postoperative Femoral Thrombo-Phlebitis, Mobile Medical and Surgical Journal, November, 1904.

President's address before the Southern Surgical and Gynecological Association, Transactions, 1905.

Treatment of Prostatic Hypertrophy, Old Dominion Journal of Medicine and Surgery, August, 1904.

An Interesting Case of Subastragoloid, Disarticulation, Charlotte Medical Journal, May, 1904.

Treatment of Renal Calculi and Pyelitis, Virginia Medical Semimonthly, March, 1906.

A Bladder Tenaculum, Old Dominion Journal of Medicine and Surgery, July, 1909.

Concerning the Diagnosis and Treatment of Prostatic Hypertrophy, Read before the Piedmont Medical Society, April 20, 1909.

Chaucer in his Canterbury Tales must have had such a physician as Dr. Bosher in mind when he said:

"A Doctor of Physic road with us along;
There was none like him in this wide world's throng,
To speak of physic and of surgery;
For he was grounded in astronomy.

He knew the cause of every malady,
Were it of cold, or hot, or moist, or dry,
And how engendered—what the humors were—
He was a very perfect practicer.

He was all clad in crimson and sky-gray,
With thin silk lined, and lustrous taffeta."

Dr. Bosher never married. He lived with his sister, who mothered him and was fathered by him in return.

He was a very silent man, but would talk a plenty when something worth while was being discussed. His advice was constantly being sought, because he only gave it after mature deliberation. He was a tower of strength in consultation because he had a broad knowledge of pathology and the ability of classifying symptoms complex to make an accurate picture of disease. He had seen many sick people and knew many ways to make them both comfortable and well.

As Chaucer says of the Physician:

> "The cause once known, and root of the disease,
> Anon he placed the sick man at his ease."

His surgery was carefully done, but it was in surgical judgment that he excelled.

Bosher was the Virginia Gentleman at all times, with the greatest respect for the opinions of others but at the same time holding to his own unless very deciding proof could be brought to make him change.

He was very diffident and modest—painfully so at times.

His patients loved him, but they had to make all of the demonstration of affection, because while he often reciprocated, he would never tell them of his feeling. He demonstrated his feelings by kind deeds rather than by words of affection.

His last years were ones of suffering. He struggled on manfully always putting the best foot forward. The last few months of his life were spent with less discomfort. He was even able to operate a little. We began to hope that his iron will might be able to force back the malady that seemed to be strangling him.

The end came quickly, just as was his wish.

He died within an hour.

The South has lost a great surgeon, the community has lost a splendid citizen, and conscientious Christian, and we have lost a wise counsellor and friend but as a wise Arabian says:

> "On parent knees, a naked newborn child,
> Weeping thou sat'st while all around thee smiled,
> So, live, that sinking in thy last long sleep
> Calm thou may'st smile, while all around thee weep."

In Memoriam

DR. CHARLES STILLWAGEN

By Dr. E. A. Weiss

DR. CHARLES AUGUSTINE STILLWAGEN was born at Claysville, Pennsylvania, on April 6th, 1866. He received his college degree at Washington and Jefferson College after which he entered Jefferson Medical School from which he graduated in 1902. After two years interneship he began the practice of medicine in Pittsburgh where he soon built up a large general practice, although he was always particularly interested in gynecology. After two years special study in Europe, he returned to Pittsburgh where he devoted his entire time to gynecology, being associated for several years with Dr. X. O. Werder. His affiliation with the Pittsburgh Hospital as gynecologist was a large factor in the success of that institution and it was there that he worked untiringly until poor health compelled him to relinquish his labors. For several years he was also gynecologist to the Columbia Hospital and also on the active staff of the Roselia Maternity Hospital and Foundling Asylum.

For several years he had indifferent health but when his country made its appeal to the medical profession, he insisted on offering his services and was finally commissioned Captain to active service in the Medical Corps, but after several months' service he was honorably discharged. He resumed his hospital connections in Pittsburgh but his health was so broken that he was compelled to give up his active work, and after six months of continued illness, he died June 4, 1921.

Dr. Stillwagen was a man who had a host of friends and no enemies. His kind genial personality endeared him to all. He was a physician of attainment and a surgeon possessing sound judgment and exceptional ability. His precise technic and conservative manner combined with years of careful study and extensive practice placed him in the front ranks of gynecological achievements.

While firm in his convictions he was never dogmatic. As an advocate of the principle of delay rather than haste in operating on ruptured ectopic gestation, he wrote several articles with report of many cases. Several contributions to medical literature on this subject show the care and careful study he gave his work. As a plastic surgeon,

he excelled by following the teaching of masters rather than devising new methods.

In 1911 he became a member of the American Association of Obstetricians and Gynecologists and while his contributions were only occasional, they were all of high merit and expressed his convictions based on a large experience. He married Stella Kelly in 1902. His wife and seven children survive him.

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